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March 16, 2001

Yvonne T. Dixon, Esquire  
Director, Office of Appeals  
National Labor Relations Board  
Franklin Court Building  
1099 14th Street, NW; Room 8820  
Washington DC, 20570-0001

Re:        American Institute of Physics; Case No. 5-CA-29366

Dear Ms. Dixon:

Charging Party Jeff Schmidt ("Schmidt") respectfully appeals Region 5's dismissal of his unfair labor practice charge alleging that his employer, the American Institute of Physics ("Institute"), discharged Schmidt in violation of Sections 8(a)(1) and 8(a)(3) of the Act. The dismissal should be reversed and a complaint issued because the available evidence shows that the Institute's termination of Schmidt was motivated solely by Schmidt's significant history of concerted activity to improve the working conditions of he and his co-workers at the Institute.

The Institute's asserted reason for firing Schmidt -- that he wrote a book in part on company time -- is a transparent pretext. In conformity with the industry norm, many writers employed by the Institute did outside writing on company time. The Institute took no disciplinary action against those employees; rather, it condoned (or even encouraged) the practice. What distinguished Schmidt, and ultimately led to his discharge, was that for many years he spearheaded concerted employee efforts to improve working conditions at the Institute, and did so in the face of blunt warnings that he must stop such protected activity or "pay the penalty." When Schmidt persisted, management seized upon Schmidt's



“admission” that he wrote his book on company time to rid itself of the budding unionist. Such retaliation is an archetypal violation of the Act.

### SUMMARY OF THE CASE

Jeff Schmidt worked as an editor for *Physics Today*, a magazine owned and published by the Institute for 19 years. During that time, he consistently produced commendable work product. Nonetheless, on May 31, 2000, he was summarily fired, supposedly for doing what he and others (at the Institute and throughout the industry) did with management’s tacit blessing – using his spare time at the office to engage in freelance writing.

The real explanation for this otherwise inexplicable conduct lies in Schmidt’s protected activity and management’s displeasure at such activity. Thus, throughout Schmidt’s tenure at *Physics Today*, he participated with, and often organized, his co-workers in concerted activity seeking to improve the working conditions of the magazine’s staff. On many occasions, both orally and in writing, Schmidt presented the concerns felt by he and his colleagues on a variety of matters, including the felt need for relief from an increasing workload, the abusive treatment staff received from some managers, and a request for increased staff participation in grievance procedures.

Management’s response was also consistent. It actively discouraged such activity. Evidence of the Institute’s animus (detailed below) includes verbal outrage at Schmidt for speaking on behalf of his co-workers at staff meetings, performance evaluations criticizing Schmidt’s concerted activity (not his work product), and even an order forbidding Schmidt and his co-workers from having private conversations concerning

workplace concerns. Ultimately, in 1998 (and again in 1999) Schmidt was downgraded on his performance review, explicitly because of his protected activity in voicing his, and his co-workers, concerns. When he appealed to higher management, arguing that this review constituted an improper reprisal for protected activity, he was told by the Director of *Physics Today* that “when you do things your supervisors would be happier that you not do, then you have to be willing to pay the penalty.”

In April 2000, Schmidt published his first book, Disciplined Minds: A Critical Look at Salaried Professionals and the Soul-Battering System That Shapes Their Lives.<sup>1</sup> While the vast majority of the writing was done at home, including a six-month unpaid leave of absence, Schmidt also worked on the book during his lunch hour and breaks. At the time, such activity engendered no comment from management. That was not surprising, for it was commonplace for employees (at *Physics today* and throughout the industry) to pursue freelance work at the office. Others at *Physics Today* did so openly and were not reprimanded, even when their freelance work was well-known to management.

Nonetheless, the Institute seized on a single passage of hyperbole in the Introduction to Schmidt’s book -- the statement that “This book is stolen. Written in part on stolen time.” -- to fire him. That was an obvious pretext. Management was not upset that one of its editors had become a successful author. Rather, management saw Schmidt’s literary characterization of his production methods as the perfect excuse to rid itself of an employee who, against management’s wishes, continued to organize his fellow workers to

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<sup>1</sup> Schmidt, Jeff. Disciplined Minds: A critical look at salaried professionals and the soul-battering system that shapes their lives; Rowman & Littlefield Publishers, Inc., 4720 Boston Way, Lanham, Maryland 20706.

stand up for their rights. For that infraction, the Institute inflicted the ultimate workplace penalty – summary dismissal. In doing so, it violated the most basic provisions of the Act.

### **STATEMENT OF FACTS**

Jeff Schmidt began working as an editor for *Physics Today* in March 1981. See Exhibit 2, Affidavit of Jeff Schmidt<sup>2</sup> (“Schmidt Aff.”), p. 1, ll. 3-4. During his 19 years at the Institute, Schmidt continuously participated in, and often organized, concerted activity aimed at improving the working conditions of the magazine’s support staff, writers, and other editors. These concerted activities were often met with criticism and reprisals from management. Below is a description of some of the activities that Schmidt participated in, and of management’s responses thereto.

#### **Schmidt’s Concerted Activity and Management’s Hostility to Such Activity**

(1) In October 1983, Schmidt and five co-workers boycotted the annual *Physics Today* advisory committee luncheon to protest the support staff’s exclusion from the committee meeting. Schmidt and co-worker Daniel Gladstone wrote a memorandum, signed by eight staff members, explaining the protest,<sup>3</sup> and submitted it to the magazine’s

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<sup>2</sup> Because the Regional Director issued a “short form” dismissal (See Exhibit 1), we cannot tell his reasoning for refusing to issue a complaint in what appears to us is a clear violation. It may be that Mr. Schmidt, who was then unrepresented did not fully appreciate the significance of adducing facts concerning his protected, concerted activity and management’s animosity to such activity, or that he did not understand the importance of showing what is obvious to any writer or editor, that freelance writing was accepted and encouraged, at *Physics Today* and throughout the industry. Accordingly, we take this opportunity to supplement the record and, if thought necessary by the Office of Appeals, would be happy to cooperate in any further investigation.

<sup>3</sup> The body of the Memo stated:

We regret we will not attend today’s lunch. Because we are no longer included in the day’s substantive discussions, we do not feel it is appropriate for us to attend the day’s more social event. We are sorry

advisory committee. See Memo from *Physics Today* Staff to The Advisory Committee and Dr. H. Davis, dated Oct. 11, 1983 (Exhibit 3). The Institute's management called a meeting of the *Physics Today* staff and demanded greater discipline. Later that month, Schmidt and several co-workers drafted and issued a seven-point memo, "General Problems With [*Physics Today*] management," raising concerns around "work flow," "delegation of responsibility," "staff input," and "keeping staff informed." See Memo dated October 27, 1983 (Exhibit 4).

(2) In November 1989, Schmidt assisted Per H. Anderson, a co-worker who had recently been fired, in preparing his appeal to the Director of the Institute. The appeal detailed Andersen's mistreatment by management, including an "unacceptable workload and salary." See Letter (Draft) to Dr. K. Ford from Per H. Anderson, dated November 21, 1989 (Exhibit 5).

(3) In January 1991, Schmidt played a leading role in organizing seven staff members to meet off-site and discuss working conditions at *Physics Today*. Following that meeting, the group drafted a memo addressing their concerns and the need for improving the magazine's "perennial scheduling problem," "low morale at *Physics Today*," and management's "disrespectful and frequent abusive treatment of staff members." See Untitled Memo (Exhibit 6). Because one or two members of the group were fearful of reprisal, the memo was never submitted to management. At subsequent staff meetings, however, Schmidt raised these issues with management.

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to inform you so late, but we had been waiting for a more definite invitation to be made.

Memo from Physics Today Staff to The Advisory Committee and Dr. H. Davis, dated Oct. 11, 1983 (Exhibit 3).

(4) In June 1994, Schmidt organized a meeting of ten staff members to specifically address the disrespectful, sometimes abusive treatment they received from the Editor of the magazine, Gloria Lubkin. When Managing Editor Kenneth McNaughton discovered the meeting in process, he asked if he was supposed to be invited, and Schmidt spoke for the group and told him he was not.

(5) In April 1995, Schmidt spoke out on behalf of the staff against the increasing workload, and McNaughton responded by questioning Schmidt's own personal workload, in front of his colleagues. Schmidt relayed this occurrence in a memo to Editor Steve Benka, dated May 25, 1995, stating "I am sure you recall that when I spoke strongly on behalf of the staff [about the increasing workload at the magazine], McNaughton responded with an angry personal attack, saying that I haven't done more work. . . . this marks the first time a manager has become angry about [my expression of views on the quantity of my work]. See Memo to Editor Steve Benka from Jeff Schmidt, dated May 25, 1995 (Exhibit 7).

(6) In October and November 1996, Schmidt and several other co-workers, including Jean Kumagai, Toni Feder, and Paul Elliott, lobbied management to hire additional staff to help with their increasing workload. After discussions with more co-workers, Schmidt, Kumagai, Feder, and Elliott prepared and presented a ten-point list of changes to be implemented in the workplace. See Proposals for discussion at *Physics Today* retreat, dated November 15, 1996 (Exhibit 8). Among the requests were: (1) better job security; (2) staff involvement in workplace dispute resolution; (3) better distribution of job tasks; and (4) changing hiring practices to increase diversity. See Exhibit 8.

(7) In September 1997, Schmidt and a majority of staff members presented a similar list of requests to management and requested time on the agenda to raise staff concerns at the company retreat. Management responded angrily in the debates between staff and management over the proposed agenda in the days leading up to the September 25 retreat. At a staff meeting before the retreat, Schmidt again asked Editor Charles Harris to include more support staff. Harris responded that he did not want them to attend. At the retreat, when Schmidt raised the issue of whether staff members may ask questions, Harris said no. When Schmidt questioned Harris' position, Harris angrily shouted, "No! That's an order!" Following this episode, Harris commented negatively to Schmidt's co-workers about Schmidt's job performance, and he told Schmidt that he thought Schmidt's request for the right to ask questions was a disguised attempt to raise issues of staff concern.

(8) October 1, 1997, Harris and Benka issued Schmidt a written notice implying that Schmidt may be fired the next time he said anything that management considered "counterproductive." See Memo to Jeff Schmidt from Charles Harris, dated September 26, 1997 (Exhibit 9). This notice also prohibited Schmidt from discussing this issue with his co-workers, stating:

"We welcome constructive and productive contributions from you, but behavior by you that we consider destructive and counterproductive will no longer be tolerated. Your continued interruption at our retreat, after you were instructed to hold your questions and comments until the discussion segment of the agenda, is an example of what we mean. The continuation of such behavior on your part, in the office or at any work-related activity, will not be tolerated. This notice is to be treated as confidential.

Exhibit 9. When Schmidt informed co-workers of this warning, Harris criticized Schmidt for doing so. On October 17, 1997, Schmidt and a group of co-workers, including Jean

Kumagai, Paul Elliot, Graham Collins, and Toni Feder, presented a written grievance to the *Physics Today* Advisory Committee at its annual meeting stating:

What concerns us is the increasingly repressive work environment at the magazine. . . . We regret having to be the undersigned here, but in the last year . . . we have been increasingly subjected by management to verbal abuse, direct threats of dismissal and warnings about speaking out in front of both *Physics Today* managers and others outside of *Physics Today*. . . . Both [Schmidt] and Graham [Collins] have been outspoken about problems that many of us see at the magazine. We feel that the warnings contribute to a repressive atmosphere at the magazine and restrict all of us. We hope the advisory committee will do whatever it can to get these warnings retracted and to remind the PT managers that repression is counterproductive. Such steps would go a long way toward diminishing the fear that the staff members now associate with trying to openly address problems at the magazine.

See Letter to Members of the Physics Today Advisory Committee, dated October 17, 1997 (Exhibit 10). One and one half months later, the warnings against discussing grievances with co-workers were (briefly) rescinded. See E-mail from Charles Harris to *Physics Today*, dated December 1, 1997 (Exhibit 11).

(9) In January 1998, Stephen Benka, Editor of *Physics Today*, interrupted and broke up a private conversation, held outside of working hours, between Schmidt and co-worker Toni Feder. Schmidt Aff., p. 5, ll. 27-28. Later that day, Schmidt was speaking on the telephone with Feder. Benka came into Schmidt's office and asked if he was talking to an author. When Schmidt responded that he was talking to a co-worker, Benka informed him that he wanted in on the conversation. Shocked at this invasion, Schmidt placed Feder on speakerphone and informed her of Benka's presence. Benka said that Feder should come to Schmidt's office. When she arrived, Benka demanded to know what Feder and Schmidt had been speaking about, and announced that:

he was forbidding all private conversations between staff members at work, because of the workplace activity that had taken place during the last year; he said that all conversations between staff members must be open to monitoring by management.

Schmidt Aff., pp. 5-6, ll. 27-28, 1-3. Thus, once again, private workplace dialogue was banned.

(10) In March 1998, Schmidt met with Benka to discuss Schmidt's 1998 performance review. Schmidt Aff., p. 6, ll. 9-10. In that review, "Benka condemned my workplace activities with co-workers and focused in particular on my leading role in such group activities as the 1996 retreat. . . . Benka said that I had spent a lot of time in 'disruptive efforts' and added that I had been formally reprimanded during this period, and although that it had been buried, it certainly had an effect on the office." Schmidt Aff., p. 6, ll. 10-15. Benka then warned, "Anything -- any behavior that generates such feelings, such divisions, such divisiveness, such disruption among the staff -- is not going to be tolerated anymore." When Schmidt told Benka that staff members feared reprisal for raising workplace problems to management, Benka responded:

Now, why would they fear that? If they're acting in good faith, then why would they fear it? But if they're not acting in good faith, they may have reason. If they're acting in order to engender divisiveness and trouble, if they're acting in bad faith, they may have reason to fear. If they're that afraid, maybe they should go where they're less afraid -- if it's that unbearable.

Schmidt Aff., p. 6, ll. 9-19.

(11) On the evaluation form, Benka reduced Schmidt's performance rating from "Exceeds Job Requirements" to "Meets Job Requirements." Schmidt Aff., p. 6, ll. 17-19. Benka also added a large increase in Schmidt's workload, whereby he would now be expected to edit 18 articles a year, rather than 14, a 28% increase.



(12) Schmidt appealed his performance review to James Stith, Director of *Physics Today*, and <sup>Theresa</sup> ~~Kathy~~ Braun, the Director of Human Resources. In his appeal, Schmidt contended that the “biased review [he] received was punishment for [his] organizing activity at the magazine.” See Memo from Jeff Schmidt to Theresa Braun and James Stith, Subject: [Schmidt’s] 1998 performance review, dated April 27, 1998 (Exhibit 12).

(13) Several months later, Schmidt met with Stith about his 1998 performance review. In that meeting, Stith “made it clear to me that my workplace activity, apart from my job assignments, played a central role in my critical review and lowered job performance rating.” Schmidt Aff., p. 6, ll. 21-23. In a response to Schmidt’s complaints of improper retaliation, Director Stith bluntly warned “when you do things your supervisors would be happier that you not do, then you have to be willing to pay the penalty, even if what you do is right.” In their meeting, Stith acknowledged that he knew about the “ban on private conversations in the workplace” and “would look into it.” Schmidt Aff., p. 6, ll. 24-25.

The ban, however, was never rescinded.

(14) To the contrary, upon returning from a six month unpaid leave of absence (December 1998 to June 1999), Schmidt was immediately criticized by Benka for sharing his appeal with his co-workers and told Schmidt “that he was lucky to still have [his] job after doing that.” Schmidt Aff., p. 7, ll. 3-7.

(15) In August 1999, Schmidt received his job performance review for the period from February 1998 to August 1999. This review stated, “[d]uring this review period, Jeff repeatedly engaged in disruptive and counterproductive behavior, damaging a collegial office climate, thereby undermining the editorial effort of *Physics Today*. Such behavior is unacceptable.” Schmidt Aff., p. 7, ll. 15-17. When Schmidt met with Benka to

discuss the review, “Benka expressed anger about [Schmidt’s] communications with co-workers about workplace issues.” Schmidt Aff., p. 7, ll. 26-27. Benka then admonished Schmidt for “talking to co-workers about the 1999 performance review and demanded that [Schmidt] tell him which co-workers [he] had spoken with about issues raised in the 1999 review,” which Benka again requested in an e-mail to Schmidt. Schmidt Aff., p. 8, ll. 5-10.

(16) Later that month, Schmidt met with several other co-workers to discuss “how to protect our right to communicate privately . . . about workplace issues such as performance reviews and punitive treatment by management.” Schmidt Aff., p. 8, ll. 11-15. In that meeting, Schmidt informed the co-workers that Benka wanted the names of the staff members with whom Schmidt had shared the results of his 1999 performance review. Schmidt Aff., p. 8, ll. 11-12. When Schmidt refused to give Benka the names of those co-workers, Benka reiterated his opposition to private conversations between staff members about workplace issues and responded, “everything to do with the job is [his] domain and there should be no privacy from [him].” Schmidt Aff., p. 8, ll. 18-20.

In sum, by late 1999, management had made it eminently clear that it wanted Schmidt’s concerted activity to stop. It also had repeatedly threatened him with dismissal if its warnings were not heeded.

### **Schmidt’s Firing**

In April 2000, Schmidt published his first book, Disciplined Minds: A Critical Look at Salaried Professionals and the Soul-Battering System That Shapes Their Lives. In the Introduction of the book, Schmidt writes:

This book is stolen. Written in part on stolen time, that is. I felt I had no choice but to do it that way. Like millions of others who work for a living, I was giving most of my prime time to my employer. My job simply didn’t leave me enough energy for a major project of my

own, and no one was about to hire me to pursue my own vision, especially given my irreverent attitude toward employers. I was working in New York City as an editor at a glossy science magazine. . . . So I began spending some office time on my own work, dumped my TV to re-appropriate some of my time at home, and wrote this book.

Exhibit 13.

On May 31, 2000, Stephen Benka, Editor of *Physics Today*, Theresa Braun, the Institute's Director of Human Resources, and Randolph Nanna, the Publisher of *Physics Today*, called Schmidt to the personnel department, where Benka told Schmidt:

We see in your own introduction to your own book that you have stolen from the magazine. Therefore, you can no longer be employed by *Physics Today*. Your employment is terminated, now.

Schmidt Aff., p. 2, ll. 3-6. No other reason was ever given to Schmidt or, to his knowledge, to anyone else for his dismissal.<sup>4</sup> Schmidt was then told that he would not be allowed to reenter the building at any time or for any reason, and he was escorted to the front door. Schmidt Aff., p. 2, ll. 10-11. Benka then called a meeting of Schmidt's co-workers, and informed them that Schmidt had been fired for cause. Later in the day, Benka went from office to office, cryptically explaining to Schmidt's co-workers that Schmidt had been fired for doing "something other than what Schmidt had been paid to do." Schmidt Aff., p. 2, ll. 18-24. Neither Benka, nor Nanna, nor Braun, however, asked Schmidt what he meant by "office time" or whether he had actually worked on the book during working time. In fact, Schmidt's reference to "stolen time" was hyperbole, a

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<sup>4</sup> In a proceeding before the State of Maryland Department of Labor to determine Schmidt's eligibility to receive unemployment benefits, the Institute contended that Schmidt "was discharged from the [Institute] on 6/2/00 because it was alleged that the claimant wrote a book on company time." <sup>4</sup> See Exhibit 14.

literary reference to Abbie Hoffman's 1971 classic, Steal This Book. Schmidt Aff., p. 3, ll.

38-39, and he swears that:

I never used any work time except break time and lunchtime to work on my book. I always gave company work priority, even over break time and lunch time and weekends, and for 19 years I had the best record of meeting deadlines of any staff member. The production department kept and has these records.

Schmidt Aff., p. 4, ll. 1-4.

Although Schmidt did not work on his book during company time during his tenure at the magazine, many of his co-workers openly pursued work that was not related to the magazine while on company time. Declaration of William Sweet<sup>5</sup> ("Sweet Decl.") ¶ 6; Declaration of Chris Mohr<sup>6</sup> ("Mohr Decl."), ¶ 6. None were fired, disciplined or even admonished to stop. For example, William Sweet ("Sweet") who was employed at *Physics Today* from March 1984 until 1993, stated that "upon being hired, [he] asked the Editor in Chief, Hal Davis, whether [he] could pursue freelance projects while [Sweet] worked at *Physics Today*. Davis said that that would be fine as long as I did not attach *Physics Today* or the Institute to anything [Sweet] wrote." Sweet Decl., ¶ 4. Sweet also confirmed with human resources, then headed by Theresa Braun, that he would have unlimited long-distance telephone privileges as a benefit of working at the Institute. Sweet Decl., ¶ 4.

Typical of other employees at the magazine, Sweet openly worked on a number of freelance pieces, making long-distance calls, using the company's computer and the magazine's library for research, and discussing the articles with his co-workers. Sweet

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<sup>5</sup> Declaration of William Sweet, Exhibit 15.

<sup>6</sup> Declaration of Chris Mohr, Exhibit 16.

Decl., ¶¶ 6, 8. One particularly provocative article resulted in a great deal of controversy and publicity. This article, which concluded that a nuclear explosion had occurred at Chernobyl, led to many responsive articles and interviews of Sweet, which ultimately connected Sweet with the Institute. See Exhibit 15. Nonetheless, Sweet was in no way disciplined. Sweet Decl., ¶ 7.

*Physics Today's* tolerance of outside work on company time reflects the norm in the industry. As Sweet explains:

In my experience, freelancing on an employer's time (and using an employer's resources) is and was ubiquitous in the newspaper and periodical industry. It generally is taken for granted that reasonably ambitious people will use company time, long distance telephone privileges, research facilities, and the company's computers to further their own writing careers.

Sweet Decl., ¶ 8.

Further, *Physics Today* had an exact way of defining peoples' jobs. If you did your job, then you would not be bothered. Writers were expected to write one page a week or four pages a month; editors were expected to edit one article every two weeks. In theory, if I completed four pages in one week, I would have the remaining three weeks to work on other things. . . . [T]he employer benefits from such a practice as these writers will give the magazine the right of first refusal for publication. Freelance work can increase a staff writer's stature and lead to valuable spin-off projects for one's employer. Indeed, my MIT article about Chernobyl led to a tip that resulted in my writing a major investigative piece on a closely related subject, which *Physics Today* published.

Sweet Decl., ¶¶ 5, 8.

Another *Physics Today* editor, Chris Mohr, also spent a considerable amount of time pursuing freelance projects while working for the magazine. In his declaration, Mohr states:

While at *Physics Today*, I wrote some pieces for small magazines, notably *Lies of Our Times* (now defunct). That magazine published

one long piece detailing scientists' participation in the Gulf War ("The Gulf War and the Technologists," March 1992), as well as several shorter items. I spent upwards of 20 hours working on the article total, of which at least 15 hours was spent at work. On other pieces I wrote while at *Physics Today*, I would generally write 80% of the article at work, and 20% at home. I did all the writing on my computer at work and read all the source material while at work because it was based on the scientific magazines and publications received by *Physics Today*. I did this openly and spoke with co-workers about the article. No one ever said anything about my working on this piece.

\* \* \*

It was my understanding that AIP, as an institution, encouraged the practice of its employees doing outside writing. The Institute's history department published books of employees which were understood to have been written on company time. To my knowledge the Institute never had a policy against its employees pursuing and publishing writings outside the Institute, and doing such work on company time.

Mohr Decl., ¶¶ 6, 8.

In fact, several employees of *Physics Today* published articles while they were employed there. See Exhibit 17. In 1994, *Physics Today's* Managing Editor Kenneth J. McNaughton pursued a 200-page editing project as a guest editor, while Managing Editor. See *Creativity Research Journal*, Vol. 7, Nos. 3 and 4, 1994 (Exhibit 17).

### ARGUMENT

On these facts, there is little doubt that Schmidt's firing violated the Act. Schmidt openly and consistently engaged in protected concerted activity, such activity was known to the management of *Physics Today*, and management repeatedly criticized, disciplined, and targeted Schmidt because of his participation in protected activity. This demonstrated animus, combined with the transparently pretextual nature of management's stated reason for firing Schmidt, leave little doubt that management's motive was unlawful. Certainly, Schmidt deserves his day in court to make that case.

**A. Legal Standard**

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Section 8(a)(1) of the National Labor Relations Act provides:

It shall be an unfair labor practice for an employer – (1) to interfere with, restrain, or coerce employees in the exercise of the rights guaranteed by Section 7.

29 U.S.C. § 158(a)(1). Section 7 protects the rights of employees “to engage in concerted activities for the purpose of collective bargaining or other mutual aid or protection.” 29 U.S.C. § 157. Although “concerted activity” is not expressly defined in the Act, the term “clearly enough embraces the activities of employees who have joined together to achieve common goals.” New River Industries, Inc. v. NLRB, 945 F.2d 1290, 1294 (4th Cir. 1991). Letters, or other writings, intended to resolve or call attention to conditions of employment are considered protected, concerted activity. See id. at 1295. The activity, must, however, be engaged with or on the authority of other employees, and not solely by and on behalf of the employee himself. Meyers Industries, Inc., 268 NLRB 493 (1984).

“Once the activity is found to be concerted, an 8(a)(1) violation will be found if, in addition, the employer knew of the concerted nature of the employee’s activity, the concerted activity was protected by the Act, and the adverse employment action at issue was motivated by the employee’s protected concerted activity.” Meyers Industries, Inc. 268 N.L.R.B. 493, 17 (1984); Wright Line, 251 NLRB 1083 (1980), enfd. 662 F.2d 899 (1st Cir. 1981). Section 8(a)(3) protects against firings [of employees] due to anti-union animus. See Dorsey Trailers, Inc. v. NLRB, 233 F.3d 831, 839 (4th Cir. 2000) (citing NLRB v. Wright Line, 662 F.2d 899 (1st Cir. 1981)). In order to establish an employer’s discriminatory discharge, the “General Counsel must prove by a preponderance of the evidence that anti-union animus was a substantial or motivating factor in the discharge.” Id. The burden then shifts to the employer to prove that it would have fired the employee

even in the absence of anti-union animus. *Id.* If the Board finds that the Institute's stated reason for firing Schmidt is false, the Board may draw the inference that the Institute discharged Schmidt for unlawful reasons. *Active Transportation*, 296 NLRB 431, 432 n.8 (1989).

**B. Schmidt's history of concerted, protected activity was well known by the Institute and the Management of *Physics Today***

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There is no doubt that Schmidt engaged in concerted activity protected by the Act. He and his co-workers shared a rich history of collective activity aimed at improving conditions for support staff, writers, and other editors. For many years, Schmidt and his co-workers repeatedly addressed issues concerning: (1) requests for relief from an increasing workload; (2) staff involvement in dispute resolution, decision-making, the hiring process, and staff's attendance at the Institute's annual conference; (3) relief from disrespectful and abusive managers; and (4) relief from management's restrictions on staff's private communications on both working and non-working time. *See Exhibits 4, 5, 9, and 10.* This activity clearly was intended to call management's attention to perceived deficiencies in working conditions.

It also clearly was "concerted." Typically, Schmidt and his co-workers would hold a meeting to discuss workplace problems and potential solutions. Thereafter, one or more co-workers, usually including Schmidt, would draft a memoranda on behalf of the staff, and present their concerns to management. Sometimes, Schmidt and his co-workers would raise their concerns verbally at staff meetings. In short, Schmidt acted not as a lone wolf looking out for his own interests; rather, he acted as a spokesperson for his fellow workers. Accordingly, his activity was protected by the Act. *See New River Industries*, 945 F.2d at 1295; *Meyer Industries, Inc.* 268 NLRB at 497.



**C. Management repeatedly criticized, disciplined, and ultimately discharged Schmidt in retaliation for Schmidt's participation in these activities.**

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Schmidt's concerted, protected activity invariably was met with reprisals from management. Schmidt's protected activity was criticized publicly, he was downgraded on his evaluation expressly because of his protected activity, he was ordered to stop having private communications with co-workers about workplace issues, and he was admonished that if such activity continued, he would have to "pay the penalty." Ultimately, when management thought that it had a lawful excuse, it carried out its threats and fired Schmidt.

A few examples suffice. At the 1997 retreat, Schmidt attempted to raise work place concerns. Harris responded with an outburst, screamed at Schmidt, and ordered him to stop raising staff issues during the retreat's question and answer period. This was not a mere isolated loss of temper. It was followed by a written warning to Schmidt (following the retreat) that he should refrain from such "counterproductive" behavior and that he should not discuss this warning with his co-workers.

Management's criticism of Schmidt's concerted activity was the main focus of Schmidt's 1998 and 1999 performance evaluations. Despite the fact that the stated purpose of such evaluations was to "give the employee an opportunity to sit down with [his or her] supervisor to review how [the employee's] work has progressed since the last review" (see AIP Employee Handbook, 1999, p. 18 [emphasis added] (Exhibit 18)), Schmidt's 1998/99 evaluations barely addressed the quality of his work product; they focussed on his tenacity in raising workplace concerns that management did not want to hear.

When Schmidt appealed his 1998 evaluation to the Institute's Director of Physics Programs, James Stith, Director Schmidt bluntly admitted that "[Schmidt's] workplace activity, apart from [his] job assignments, played a central role in [Schmidt's] critical review and lowered job performance rating." Schmidt Aff., p. 6, ll. 21-23. Stith also added, prophetically, that, "When you do things your supervisors would be happier that you not do, then you have to be willing to pay the penalty, even if what you do is right." (read "protected").

By August 1999, management had clearly lost patience with Schmidt's refusal to stop speaking out. They had reinstated their prohibition, originally instituted in January 1998, against all private workplace conversations between staff members. This ban, clearly aimed mainly at Schmidt, amounted to an announcement that all communications among employees would be monitored; in Editor Benka's words, "everything to do with the job is [management's] domain, and there should be no privacy from [management]." Schmidt Aff., p. 8, ll. 18-20.

When this measure proved incapable of silencing Schmidt, management welcomed even a weak pretext for dismissing him. It seized on a single literary passage in Schmidt's book to fire him, supposedly for writing on "stolen" time. Unfortunately for the Institute, Schmidt did not "steal" any time. He merely did what many colleagues had done for many years; he used non-working down time and facilities to do freelance writing, a practice condoned by *Physics Today* and virtually every other periodical in the industry.

- D. The Institute's stated reason for firing Schmidt is false. The Institute would not have fired Schmidt in the absence of his protected, concerted activity as evidenced by the Institute's practice of allowing and even facilitating the industry's custom of allowing its employees to pursue their own personal writing on company time.
- 

If the Board finds that the Institute's stated reason for firing Schmidt is false, the Board may draw the inference that the Institute discharged Schmidt for unlawful reasons. Active Transportation, 296 NLRB 431, 432 n.8 (1989). The Institute has stated, on at least two separate occasions, that it terminated Schmidt because he worked on his book during company time. At Schmidt's dismissal, Editor Steve Benka told Schmidt:

We see in your own introduction to your own book that you have stolen from the magazine. Therefore, you can no longer be employed by *Physics Today*. Your employment is terminated, now.

Schmidt Aff., p. 2, ll. 3-6. No other reason was ever given. Also, in the proceedings before the State of Maryland Department of Labor, the Institute contended that Schmidt "was discharged from the [Institute] on 6/2/00 because it was alleged that the claimant wrote a book on company time." <sup>7</sup> See Exhibit 14.

That this was the Institute's true reason for firing Schmidt, is belied by the Institute's long history of condoning, or even encouraging, outside writing, and it is inherently incredible, given the longstanding industry practice. For example, William Sweet who was employed at *Physics Today* from March 1984 until 1993, stated that "upon being hired, [he] asked the Editor in Chief, Hal Davis, whether [he] could pursue freelance projects while [Sweet] worked at *Physics Today*. Davis said that that would be fine as long as [he] did not attach *Physics Today* or the Institute to anything [Sweet] wrote." Sweet

---

<sup>7</sup> Interestingly, the Department found that "insufficient information has been presented to show that the claimant's actions constituted misconduct in connection with the work." Exhibit 18.

Decl., ¶ 4. The fact that the Editor had no problem with a writer pursuing freelance work while at *Physics Today*, demonstrates that at the very least, the magazine was aware of and did not prohibit its employees from pursuing outside projects.

Moreover, the Institute provided free long distance and computer services to its employees. When Sweet was hired, he confirmed with the Human Resources Department, then headed by Theresa Braun, that he would have unlimited long-distance telephone privileges as a benefit of working at the Institute. Sweet Decl., ¶ 4. This privilege allowed Sweet to conduct long distance telephone interviews, free of charge, while at work.

Sweet and other employees at *Physics Today* did personal work during company time. Sweet openly worked on a number of freelance pieces, made long-distance calls, used the company's computer and the magazine's library for research, and discussed the articles with his co-workers. Sweet Decl., ¶¶ 6, 8. Another *Physics Today* editor, Chris Mohr, also spent a considerable amount of time pursuing freelance projects while working for the magazine. In his declaration, Mohr states:

While at *Physics Today*, . . . I did all the writing on my computer at work and read all the source material while at work because it was based on the scientific magazines and publications received by *Physics Today*. I did this openly and spoke with co-workers about the article. No one ever said anything about my working on this piece.

Mohr Decl., ¶6. No one, other than Schmidt, was ever punished for such activity.

*Physics Today's* tolerance of outside work on company time reflects the norm in the industry. One does not have to dig deep to know that many writers and editors employed by newspapers and magazines do freelance writing. Bob Woodward and Carl Bernstein were writers for the *Washington Post* when they published All the President's Men. The staff writers of *The New Yorker* are famously prolific. The list could go on and

on - - virtually every well-known journalist, including William Manchester, Jack Germond, and William Buckley, has written outside works. No one would believe that none of this writing was done on time "stolen" from the employers.

As William Sweet, a journalist of 25 years explains:

In my experience, freelancing on an employer's time (and using an employer's resources) is and was ubiquitous in the newspaper and periodical industry. It generally is taken for granted that reasonably ambitious people will use company time, long distance telephone privileges, research facilities, and the company's computers to further their own writing careers.

Sweet Decl., ¶ 8. To expect anything less of one who enters the field of journalism is unrealistic.<sup>8</sup>

At bottom, for the Institute to suggest that it fired Schmidt for working on a book during company time, is at best a fast and loose interpretation of its own practices and the industry's unwritten rules and customs. At worst, it is a calculated misrepresentation, contradicted by voluminous evidence.

On the other hand, substantial evidence (and logic) supports the view that the Institute's true motive for discharging Schmidt was its escalating hostility to his protected activity. For nineteen years, Schmidt tirelessly advocated improvement in the working conditions of the staff, writers, and editors at *Physics Today*. For the last ten years, and

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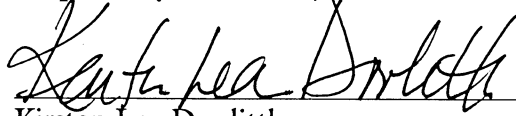
<sup>8</sup> As additional proof of the frequency of this custom, charging party has attached several articles written by other *Physics Today* staff members which were published while employed at *Physics Today*, including a 200-page article edited by *Physics Today*'s own Managing Editor, Kenneth McNaughton. See Exhibit 17. It is simply not realistic to suggest that 1) all of these articles were entirely researched, written and edited, while not on company time, and 2) that the Institute was not aware of and did not encourage this practice. We will, if the Office desires, supplement additional declarations from Schmidt's former co-workers as to their experiences pursuing freelance projects while working for *Physics Today*.

especially during the last three years, management's responses to Schmidt's organizing efforts had grown increasingly strident. Finally, they carried out the ultimate threat.

**CONCLUSION**

For the foregoing reasons, the Office of Appeals should reverse Region 5 and issue a complaint alleging that the Institute unlawfully discharged Schmidt in violation of Sections 8(a)(1) and (5) of the Act.

Respectfully submitted,



Kirsten Lea Doolittle  
DICKSTEIN, SHAPIRO MORIN &  
OSHINSKY LLP  
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Counsel for the Charging Party  
Jeff Schmidt

**Attachments**

cc: Wayne Gold, Regional Director  
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103 South Gay Street, 8<sup>th</sup> Floor  
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Jackson, Lewis, Schnitzler & Krupman  
1000 Woodbury Road, Suite 402  
Woodbury, NY 11197

Mr. Marc H. Brodsky  
American Institute of Physics  
1 Physics Ellipse  
College Park, MD 20740





United States Government  
NATIONAL LABOR RELATIONS BOARD  
Region 5  
103 South Gay Street, 8th Floor  
Baltimore, MD 21202-4061

(410) 962-2822

February 9, 2001

MR. JEFF SCHMIDT  
3003 VAN NESS ST., N. W.  
WASHINGTON, D. C. 20008

Re: American Institute of Physics  
Case 5-CA-29366

Dear Mr. Schmidt:

The above-captioned case, charging violations under Section 8 of the National Labor Relations Act, as amended, has been carefully considered.

As a result of the investigation, it appears that, because there is insufficient evidence of a violation, further proceedings are not warranted at this time. I am, therefore, refusing to issue complaint in this matter.

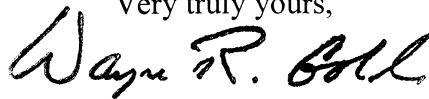
Pursuant to the National Labor Relations Board Rules and Regulations you may obtain a review of this action by FILING AN APPEAL WITH THE GENERAL COUNSEL of the National Labor Relations Board, 1099 14th Street, N.W., Washington, D.C. 20570, A COPY WITH ME and a copy with the Washington Resident Office, 1099 14th Street, N.W., Washington, DC 20570. This appeal must contain a complete statement setting forth the facts and the reasons upon which it is based. The appeal must be received by the General Counsel in Washington, D.C. by the close of business at 5:00 p.m. EST on February 23, 2001. The appeal MAY NOT be filed by facsimile transmission. Upon good cause shown, however, the General Counsel may grant special permission for a longer period within which to file. Requests for extension of time MAY be filed by facsimile transmission, and must be received no later than the time set forth above for the filing of the appeal. A copy of any such request for extension of time should be submitted to me. If you mail the appeal, it should be postmarked no later than one day before the due date set forth above.



February 9, 2001

If you file an appeal, please complete the notice forms enclosed with this letter and send one copy of the form to each of the other parties whose names and addresses are listed. The notice forms should be mailed at the same time you file the appeal, but mailing the notice forms does not relieve you of the necessity for filing the appeal itself with the General Counsel and a copy of the appeal to me within the time stated above.

Very truly yours,

A handwritten signature in black ink, appearing to read "Wayne R. Gold". The signature is fluid and cursive, with the first name "Wayne" being more prominent.

Wayne R. Gold  
Regional Director

Enclosures

CERTIFIED MAIL NO. 7000 1670 0000 6921 9831  
RETURN RECEIPT REQUESTED

cc: GENERAL COUNSEL  
NATIONAL LABOR RELATIONS BOARD  
OFFICE OF APPEALS, ROOM 8820  
FRANKLIN COURT BUILDING  
1099 14TH STREET, N.W.  
WASHINGTON, DC 20570

ATTN: MR. MARK L. SUSSMAN  
JACKSON, LEWIS, SCHNITZLER,  
& KRUPMAN  
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ATTN: MR. MARC H. BRODSKY  
AMERICAN INSTITUTE OF PHYSICS  
1 PHYSICS ELLIPSE  
COLLEGE PARK, MD 20740



City of Washington  
District of Columbia

American Institute of Physics  
Case 5-CA-29366

AFFIDAVIT

I, Jeff Schmidt, being first duly sworn upon my oath, hereby state as follows:

I have been given assurances by an agent of the National Labor Relations Board that this affidavit will be considered confidential by the United States Government and will not be disclosed unless it becomes necessary for the government to produce the affidavit in connection with a formal proceeding.

1 I reside at 3003 Van Ness Street, NW, W406, Washington, DC 20008. My telephone number  
2 is (202) 537-3645. I am currently unemployed.

3 Beginning in March 1981, I was employed as an editor by Physics Today (PT) magazine, a  
4 division of the American Institute of Physics (AIP). I was discharged on May 31, 2000. I was  
5 working two-thirds time with full benefits when I was discharged. The official workweek was 37.5  
6 hours, and I worked 25 hours. I was paid two-thirds of my full-time salary.

7 My immediate supervisor was Stephen G. Benka, Editor of Physics Today magazine. Benka's  
8 boss is Randolph A. Nanna, Publisher of Physics Today. (Nanna's predecessor, Charles Harris, was  
9 fired about March 2, 1999.) Nanna's boss is James H. Stith, Director of Physics Programs for AIP.  
10 Stith's boss is Marc Brodsky, Executive Director and Chief Executive Officer of the American  
11 Institute of Physics. The American Institute of Physics has approximately 500 employees. Theresa C.  
12 Braun is Director of Human Resources at AIP. Braun and Stith are on AIP's management committee.

13 On May 31, 2000, Benka and Nanna spoke to me while I was in the office of co-worker Judy  
14 Barker. They told me that Braun wanted to meet with us. I asked when. They said now. I said that  
15 Brodsky was conducting a meeting in five minutes time. (The meeting was to be held on the first  
16 floor.) They said that's all right. I said that I wanted to go to my office first. (I was holding copies of  
17 articles that I had just finished editing.) They followed me to my office and then escorted me to the  
18 elevator. We took the elevator from the third floor to the second floor. Historian Spencer Weart,  
19 Director of the American Institute of Physics Center for History of Physics, happened to be on the

1 elevator. Nanna, Benka, and I went to the personnel office. Theresa Braun joined us in a small  
2 conference room, and all four of us sat down.

3 Braun said that Benka would explain why we were present. Benka said, we see in your own  
4 introduction to your own book that you have stolen from the magazine. Therefore, you can no longer  
5 be employed by Physics Today. Benka said your employment is terminated, now. I objected. I said  
6 that I have not stolen from the magazine. I said this sounds like a pretext. Neither Benka nor any  
7 other manager had ever asked me a single question about the book or even mentioned it to me. I said I  
8 am two months ahead in my work. Benka said that we are not here to answer questions. They would  
9 not respond to anything I said. Braun said we are not going to talk about this today. Braun said that I  
10 would not be allowed to go back to my office. She also said that I would not be allowed to come back  
11 into the building at any time for any reason. I protested. She said we have sound reasons for  
12 everything we do. Then they called in a personnel office employee named Jonathan Goodwin and sent  
13 him to my office to fetch my coat. Thereafter, Braun and Goodwin escorted me to the first-floor front  
14 door.

15 I walked to the College Park Metro station and phoned several of my co-workers at PT and  
16 AIP, including Elliot Plotkin, Michael Neuschatz, and Spencer Weart. I left voice-mail messages,  
17 informing them that I had been fired. I reached co-worker Marian Smith. While talking to her, I could  
18 hear Benka in the background. She told me that he was calling everybody to another meeting. Many  
19 of my co-workers informed me that my discharge was the sole topic of that meeting. My co-workers  
20 informed me that at the meeting Benka said that I had been fired for cause, that he refused to give any  
21 details, and that he hoped to obtain permission from Brodsky to say more later in the day. I was  
22 informed that Benka, Nanna, and Stith were present at that meeting. I was further informed by co-  
23 workers that later that day, Benka told employees that I was fired for doing something other than what  
24 I was being paid to do. According to Irwin Goodwin, a longtime co-worker who was Physics Today's  
25 Washington correspondent at the time, management fired me "with glee" and told people about it as a  
26 happy occurrence.

27 My book was published in April 2000. I never told the company that I was writing a book.  
28 The introduction to my book begins as follows:

1  
2           This book is stolen. Written in part on stolen time, that is. I felt I  
3 had no choice but to do it that way. Like millions of others who work for a  
4 living, I was giving most of my prime time to my employer. My job simply  
5 didn't leave me enough energy for a major project of my own, and no one  
6 was about to hire me to pursue my own vision, especially given my  
7 irreverent attitude toward employers. I was working in New York City as  
8 an editor at a glossy science magazine, but my job, like most professional  
9 jobs, was not intellectually challenging and allowed only the most  
10 constrained creativity. I knew that if I were not contending with real  
11 intellectual challenges and exercising real creativity -- and if I were not  
12 doing anything to shape the world according to my own ideals -- life would  
13 be unsatisfying, not to mention stressful and unexciting. The thought of just  
14 accepting my situation seemed insane. So I began spending some office  
15 time on my own work, dumped my TV to re-appropriate some of my time at  
16 home, and wrote this book. Not coincidentally, it is about professionals,  
17 their role in society, and the hidden battle over personal identity that rages in  
18 professional education and employment.

19           The predicament I was in will sound painfully familiar to many  
20 professionals. Indeed, generally speaking, professionals are not happy  
21 campers. After years of worshipping work, many seemingly successful  
22 professionals are disheartened and burned-out, not because of their 70-hour  
23 workweeks, but because their salaries are all they have to show for their life-  
24 consuming efforts. They long for psychic rewards, but their employers'  
25 emphasis on control and the bottom line is giving them only increased  
26 workloads, closer scrutiny by management and unprecedented anxiety about  
27 job security. In this way the cold reality of employer priorities has led to  
28 personal crises for many of this country's 21 million professionals.

29  
30           The company has a one-hour unpaid lunch period and two fifteen-minute paid breaks, for a  
31 total of one-half hour of paid break time per day. The company imposed no restrictions on how  
32 employees used their break time. The PT division allows employees to take the breaks whenever they  
33 want and for as long as they want. However, I had a reputation for getting my work done and for  
34 limiting my use of social breaks. Sometimes I spent my break time and lunch time doing work for the  
35 magazine. Sometimes I spent some of my break time and lunch time working on my book. I thought  
36 about the book, jotted down notes, and used the computer in my office in a manner consistent with the  
37 company's computer use policy. Working on the book during paid break time felt like stealing time  
38 and gave me the idea for the introduction. I phrased the introduction as a nod to Abbie Hoffman's  
39 1971 classic, *Steal This Book*. Management never mentioned my use of the computer in my office

1 when they told me the reason for my discharge. I never used any work time except break time and  
2 lunch time to work on my book. I always gave company work priority, even over break time and  
3 lunch time and weekends, and for 19 years I had the best record of meeting deadlines of any staff  
4 member. The production department kept and has records.

5 In my view, the company seized upon the introduction of my book as a pretext to fire me in  
6 retaliation for the group activity and workplace activism and advocacy that I engaged in. In recent  
7 years, I engaged in workplace activism as detailed in part below. During that time, management  
8 retaliated against me because of my workplace activism with co-workers. I detail some of these events  
9 below.

10 On October 4, 1996, on behalf of staff members who had been pushing for pay equity at PT, I  
11 told the PT advisory committee, at their annual meeting, that the large salary differentials among the  
12 staff are not only unfair, but divisive and bad for morale and productivity. I also raised this issue at  
13 various staff meetings. On October 22 and October 23, 1996, I and co-workers Jean Kumagai, Toni  
14 Feder, and Paul Elliott sent messages to management in support of the hiring of additional staff and in  
15 support of staff participation in the hiring process. We requested that these issues be put on the agenda  
16 for the staff meeting scheduled for October 24, 1996. On November 15, 1996, the PT advisory  
17 committee issued a report that was critical of the working conditions at the magazine, based on staff  
18 grievances brought to the committee's attention by me and co-workers at the committee's October 4,  
19 1996 meeting. On November 15, 1996, I and co-workers gave PT's managers and staff a ten-point list  
20 of changes that we wanted to be made at the PT workplace. We presented our requests in the form of  
21 a proposed agenda for a two-day retreat scheduled for November 19-20, 1996. That agenda included  
22 job security, staff involvement in workplace dispute resolution, better distribution of job tasks, a  
23 change in hiring practices to increase diversity of the staff, and the provision of working conditions  
24 appropriate for professionals.

25 On September 18, 1997, a majority of the PT staff, led by me and others, gave managers and  
26 staff a list of concerns centered around a demand for working conditions that were appropriate for  
27 professionals. We presented our concerns as a request for agenda time at a one-day retreat scheduled  
28 for September 25, 1997. On September 22, 1997, on behalf of six staff members, I asked then PT

1 publisher, Charles Harris, to include the support staff in the September 25, 1997 retreat. On  
2 September 25, 1997, near the beginning of the staff retreat, I asked if staff members could ask  
3 questions. Harris said no. I said that staff members should be allowed to ask questions. Harris angrily  
4 shouted no, that's an order. A few days after the retreat, Harris told me that he thought that my request  
5 for the right to ask questions was a disguised attempt to raise issues of staff concern. Thereafter,  
6 management began subjecting my work to increased scrutiny.

7 On October 1, 1997, Harris and Benka gave me a written "gag order." Harris expressed his  
8 opinion that my "interruption" at the retreat was "destructive and counterproductive" and that  
9 continuation of such behavior in the office or at any work-related activity will not tolerated. The  
10 notice stated that it was to be treated as confidential, meaning that I could not discuss it with co-  
11 workers. Shortly thereafter, co-worker Graham Collins was instructed by management not to criticize  
12 Benka or Harris during staff meetings. On October 17, 1997, I and co-workers, in a written grievance  
13 presented to the PT advisory committee at its annual meeting, requested relief from the increasingly  
14 repressive work environment at the magazine. The grievance describes how Graham Collins and I had  
15 been warned about speaking up regarding workplace problems. The grievance states, "Both Jeff and  
16 Graham have been outspoken about problems that many of us see at the magazine. We feel that the  
17 [gag orders on them] contribute to a repressive atmosphere at the magazine and restrict all of us. We  
18 hope the advisory committee will do whatever it can to get these warnings retracted, and to remind the  
19 PT managers that repression is counterproductive. Such steps would go a long way toward  
20 diminishing the fear that staff members now associate with trying to openly address problems at the  
21 magazine." In addition to this written presentation, I and my co-workers also orally presented our  
22 collective grievances to the committee during private individual meetings.

23 On December 2, 1997, Harris, under pressure from the PT staff, rescinded the gag orders on  
24 me and Collins. On January 22, 1998, I asked Harris not to reduce support-staff help and referenced  
25 the discussions at prior staff meetings. Harris indicated that he was not inclined to give the request  
26 much consideration because of my workplace activity and because, he said, I tried to get him fired.

27 On January 28, 1998, after working hours, Benka broke up two private conversations between  
28 me and co-worker Toni Feder. After breaking up the second conversation, Benka told us that he was

1 forbidding all private conversations between staff members at work because of the workplace activity  
2 that had taken place during the last year; he said that all conversations between staff members must be  
3 open to monitoring by management. Shortly after January 28, 1998, co-worker Paul Elliott  
4 complained to Harris about the ban on private conversations between staff members. Elliott reported  
5 to me that Harris told him that Harris was 100 percent sure that the activity that Benka broke up  
6 between me and Feder involved my organizing against management's effort to shift clerical work from  
7 the secretarial staff to the editors.

8 On March 20, 1998, Brodsky told me that some of my workplace activities were  
9 "counterproductive." On March 24, 1998, I met with Benka to discuss my 1998 performance  
10 review. Benka condemned my workplace activities with co-workers and focused in particular on  
11 my leading role in such group activities around the November 1996 retreat, where staff members  
12 had raised issues of job security and working conditions, even though that activity occurred before  
13 the period covered by my review. Benka said that I had spent a lot of time in "disruptive efforts,"  
14 that I had been formally reprimanded during this period (an apparent reference to the gag order), and  
15 although that (the gag order) had been buried, it certainly had an effect on the office. Benka referred  
16 to the group of staff members with whom I had worked to address workplace issues as "your cabal."  
17 Benka reduced my performance rating from "Exceeds Job Requirements" to "Meets Job  
18 Requirements." In addition, Benka increased my work load from 14 feature articles per year to 18  
19 feature articles per year, a 28 percent increase.

20 On April 27, 1998, I wrote Braun and Stith to appeal my 1998 performance review. I  
21 circulated my appeal to 12 co-workers. On June 25, 1998, I met with Stith concerning my 1998  
22 performance review. Stith made it clear to me that my workplace activity, apart from my job  
23 assignments, played a central role in my critical review and lowered job performance rating. I asked  
24 Stith to repeal the ban on private conversations in the workplace. He said that he knew about it and  
25 would look into it, but he never repealed the ban. On July 16, 1998, I e-mailed a dozen co-workers  
26 concerning Stith's refusal to make any corrections to my 1998 performance review.

27 From mid-December 1998 to mid-June 1999, I took a six-month unpaid leave of absence.  
28 After I returned to work, my co-worker Paul Elliott told me that while I was away, management



1 conducted a "smear campaign" against me, with Harris and Benka referring to my absence in positive  
2 terms, and Harris more than once referring to me as a "troublemaker." Upon my return from unpaid  
3 leave in mid-June 1999, Benka harshly criticized me for the first time for showing my 1998  
4 performance review appeal to my co-workers. My performance review appeal reviewed workplace  
5 activities that I and my co-workers had engaged in. I circulated this appeal back in April 1998, about  
6 14 months earlier. Benka told me in mid-June 1999 that I was lucky that I still had my job after doing  
7 that (circulating that document).

8 In June 1999, in response to the sharp increase in my workload imposed by management, I  
9 asked PT management to allow me to perform two-thirds work for two-thirds pay. I felt that  
10 management had imposed a workload requirement that I was not sure that I could meet and that the  
11 increased workload was a punitive measure imposed because of my workplace activities. On August  
12 9, 1999, my request was approved, effective September 20, 1999. My pay was reduced by one-third,  
13 but my work was not reduced proportionately because it had already been raised by 28 percent. On  
14 August 17, 1999, I received an inaccurate and punitive 1999 performance review covering the period  
15 from February 1998 to August 1999. The review states, inter alia, "During this review period, Jeff  
16 repeatedly engaged in disruptive and counterproductive behavior, damaging a collegial office climate  
17 and thereby undermining the editorial effort of Physics Today. Such behavior is unacceptable." An  
18 example of such behavior, according to the review, was showing my co-workers my 1998 performance  
19 review appeal, a document that details workplace issues and group activities at Physics Today, as  
20 described above. The 1999 performance review punished me for this communication with my co-  
21 workers about workplace issues and stated that such communication serves to undermine the staff's  
22 respect for management.

23 On August 17-19, 1999, I held discussions with a number of co-workers to organize support  
24 for the right of employees to discuss performance reviews and other workplace issues with each other  
25 and to discuss punitive actions by management against employees. On August 19, 1999, I met with  
26 Benka to discuss my 1999 performance review. Benka expressed anger about my communications  
27 with co-workers about workplace issues. Benka highlighted my April 1998 communications with co-  
28 workers about workplace issues as set forth in the appeal that I circulated among co-workers. Benka

1 told me to pay very close attention to my influence with co-workers. He said that circulating my  
2 response to the performance review in 1998 was extremely destructive because it addressed workplace  
3 issues that had nothing to do with the review. He said that he did not want to see anything of this sort  
4 again.

5 Benka also admonished me for talking to co-workers about the 1999 performance review,  
6 which Benka wanted to keep secret. Benka demanded that I tell him which co-workers I had spoken  
7 with about issues raised in my 1999 performance review. I told him that I would first have to ask them  
8 for permission to release their names. Later that day (August 19, 1999), Benka reiterated by e-mail, his  
9 demand that I tell him the names of the staff members with whom I had discussed my 1999  
10 performance review. Benka told me that sharing performance reviews with co-workers was out of line  
11 with AIP procedures. Shortly after my August 19, 1999 meeting with Benka, I met with co-workers to  
12 decide how to respond to Benka's demands that I release their names. We also discussed how to  
13 protect our right to communicate privately about workplace issues such as performance reviews and  
14 punitive treatment by management. The performance reviews were a catalyst for discussing larger  
15 workplace issues.

16 On August 26, 1999, I informed Benka that my co-workers and I had decided not to reveal any  
17 names or any information that would identify which staff members are involved in private discussions  
18 about workplace issues. During this conversation, Benka reiterated his opposition to private  
19 conversations between staff members about workplace issues. He told me that everything to do with  
20 the job is his "domain" and that there should be no "privacy from me."

21 On September 17, 1999, the AIP and I entered an agreement that specified the amount of work  
22 that I would perform and the amount that I would be paid for such work. On November 10, 1999, I  
23 requested that my excess vacation time be carried over to 2000. A week later, co-worker Paul Elliott  
24 made an identical request. His request was granted. My request was denied, with minor exception.  
25 When discharged, I was not paid for certain vacation time, personal days and bonus days.

26 About mid-May 2000, co-worker Toni Feder and I were talking alone in the Physics Today art  
27 office. Benka approached us and told us that he noticed that we stopped talking when he showed up.

1 On May 23, 2000, I was in Rita Wehrenberg's office. (We worked together on articles that I  
2 edited.) She said that she was sorry, but she had shown Benka an article about my book in *The*  
3 *Chronicle of Higher Education*. She explained that on May 22, 2000, the article had been circulating  
4 among co-workers and she had been reading it in her office and laughing out loud, when Benka  
5 overheard her, entered her office, and asked what is so funny. She explained to me that she had no  
6 choice but to show him the article. I agreed and said it's not your fault. She told me that he took the  
7 article and stood over her and read the whole thing, and that he did not laugh or make any comment at  
8 all, but simply left her office. She said he created an awkward situation for her while he was in her  
9 office. Wehrenberg told me that the article she had been reading about my book was the one in the  
10 "Hot Type" column of the May 26, 2000, issue of *The Chronicle of Higher Education*. A copy of the  
11 article is attached hereto. The article says, among other things, that I advocate that salaried  
12 professionals form unions in their workplaces. The American Institute of Physics has a long history  
13 (dating back at least 19 years) of strongly opposing unionization by its employees.

14 On May 30, 2000, historian Spencer Weart, director of the American Institute of Physics  
15 Center for History of Physics, reviewed my book, made very positive comments, and selected my book  
16 for inclusion in the physics community section of the AIP Niels Bohr Library, a specialized collection  
17 with limited space. On May 30, 2000, I distributed Weart's review to all PT staff and management.

18 As of May 31, 2000, the date of my discharge, I had completed my entire annual review-period  
19 work quota in the first ten months of the period: I was two months ahead in my work.

20 Shortly before June 16, 2000, Physics Today told the claim examiner from the Maryland  
21 Department of Labor, Office of Unemployment Insurance, Tasha Owens, that I engaged in misconduct  
22 by admittedly using company time to work on a personal project over an extended period of time.  
23 Owens told me that at a hearing about my dismissal the company could not say what hours I spent  
24 writing the book because they did not know.

25 On August 29, 2000, former co-worker Toni Feder, who works at home, called me to tell me  
26 that Benka called a special staff meeting and told staff members not to give me any information about  
27 the magazine's hiring activities. Feder also told me that Benka also told staff members at that meeting  
28 not to discuss their performance reviews with anyone. She told me that she participated by conference

1 call. She has a practice of taking detailed notes of staff meetings. Jean Kumagai told me that Feder  
2 had reported to her, too, about the August 29, 2000, PT staff meeting.

3  
4 Throughout my 19 years at AIP, the company dictated the work standards for all of its  
5 employees. Physics Today employees who disputed these standards of work quantity and quality  
6 were nevertheless held to them. My co-workers Bertram Schwarzschild and Denis Cioffi, for  
7 example, disputed the work standards. The company nevertheless put Schwarzschild and Cioffi on  
8 probation for not coming close enough to meeting the standards. The company scrutinized my work  
9 closely against its standards, too, and never put me on probation. On the contrary, in every annual  
10 review of my job performance, management concluded ("overall rating") that I either met or  
11 exceeded the job requirements. In fact, during the years that I was writing the book, my supervisors  
12 gave me two promotions and 18 salary increases based explicitly on the quantity and quality of my  
13 work.

14 The main part of my job was editing feature articles, and my work was widely praised. The  
15 number of articles I edited per year was limited by Benka's ability to provide articles. Over the past  
16 few years I raised the issue of the chronic shortage of articles with Benka and other managers  
17 verbally countless times and in writing at least six times. Many of my co-workers were aware of the  
18 trouble I had getting work from Benka. Sometimes the only way I could get work was to ask co-  
19 workers if they would give me work that had been assigned to them.

20 Co-worker Bertram Schwarzschild's employment at Physics Today paralleled mine in  
21 starting date, job title, and salary. On June 9, 2000, Schwarzschild called me from his Physics  
22 Today office, and on December 28, 2000, I called him at his Physics Today office. During the  
23 ensuing conversations, Schwarzschild told me that management expects him to complete a certain  
24 amount of work and does not make an issue of how many hours he puts in to do it or whether he

1 does it in the office or elsewhere. Management allowed employees in my job category to pretty  
2 much set our own hours. For example, my co-worker Paul Elliott often began work after 4 p.m.

3       Schwarzschild said that management sees performance reviews as an opportunity to ask,  
4 "What more can you do for us?" He said that at about half of his performance reviews, he is told to  
5 "do more." Schwarzschild also said that management was trying to get him to commit himself to do  
6 more work than he could guarantee that he could do even though management counts his short  
7 "picture caption" stories as "big-ticket items." Those stories take him only one to a few days to  
8 complete. He told me that management's work expectations are often unreasonably high and that  
9 the amount of work he is expected to do is often the subject of dispute during his annual  
10 performance reviews.

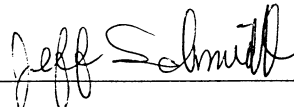
11       Schwarzschild reminded me that he disagrees "strongly" with my political views as  
12 expressed in my book and elsewhere. However, he told me that my use of office time was  
13 consistent with what management allows and with the office culture that management maintains.  
14 He told me that the amount of break time he takes is much greater than the two 15-minute breaks  
15 specified in the employee handbook. He has always done this openly, and it is well known in the  
16 workplace, by both co-workers and managers.

17       Elaborating, Schwarzschild told me that he and other Physics Today employees spend a lot  
18 of time on personal activities such as engaging in personal conversations in their offices, at the  
19 water cooler, and at the coffee maker, taking long lunch breaks, playing computer solitaire, using  
20 the Internet (for everything from locating old school chums to studying dog breeds to researching  
21 opera), exchanging personal e-mail, making personal telephone calls, running personal errands and  
22 so on. I and others observed him do these things as well as debate topics at length with co-workers,  
23 rehearse lines for plays in which he was to appear, and engage in other non-work activities. I and  
24 co-workers have been present when managers, including Benka and Nanna, observed him do many

1 of these things. Schwarzschild noted that I did not do these things and that I had a reputation for not  
2 doing them. He said that by his estimate, based on working with me and observing me for 19 years,  
3 I put in as many hours on my work for the magazine as did he and my coworkers.

4 Schwarzschild told me that his supervisor, Benka, often sees him and others pursuing non-  
5 work activities in the office and raises no objection at the time or later. Schwarzschild told me that  
6 at one time, during my period of employment, he started writing a novel at the office (but got stuck  
7 after the first few pages). He told me that at the time he was "quite open" about his personal-writing  
8 intentions with both co-workers and managers, including Benka. He said that he openly joked, in  
9 front of co-workers and managers alike, that he kept the file on his office computer "hidden" under  
10 the name "Nakamura," because that looked like a typical file name for a Physics Today article. He  
11 said that the file is still on his office computer, under that name. He said that neither Benka nor any  
12 other manager objected to his personal writing efforts or other personal use of office time. Nor has  
13 his open and liberal personal use of office time prompted managers to revisit their workload  
14 disputes with him and assert that such use of office time proves that he could or should do more  
15 work for the company or that he is cheating the company.

I have read this statement consisting of 12 pages, including this page. I fully understand its contents, and I certify that it is true and correct to the best of my knowledge and belief.

  
\_\_\_\_\_  
Jeff Schmidt

Subscribed and Sworn To Before me at  
Washington, DC  
This 4th day of January 2001

  
\_\_\_\_\_  
Board Agent,  
National Labor Relations Board

# Hot Type

**STEAL THIS BOOK:** Jeff Schmidt did. "This book is stolen," the *Physics Today* magazine editor declares at the beginning of his new work, which he wrote on the job when his bosses weren't looking. "Written on stolen time, that is."

Mr. Schmidt acknowledges that at first glance, his book could also be seen as an exercise in bait-and-switch. With the title, *Disciplined Minds*, in bold letters on the spine, and the category "Careers" stamped on the back cover, the book will no doubt attract the attention of hard-working professionals eager for an edge over their competitors—we mean, colleagues.

But Mr. Schmidt's subtitle—*A Critical Look at Salaried Professionals and the Soul-Battering System That Shapes Their Lives*—tells a different tale.

He envisions the readers of *Disciplined Minds* (Rowman & Littlefield) not as ladder-climbing careerists, but as "dissatisfied professionals and disillusioned graduate students—the majority."

Maybe you can identify. Mr. Schmidt believes that most people enter the work world or graduate school with the belief that their labor will be of social value. More often, they find that it's of only economic value—and not primarily to them. The hierarchies of professionalism leave them alone on their ladders, afraid to make a change.

If that sounds bleak, he has the solution. After examining the worlds of work and education with an eye for the political, he concludes with "Now or Never," a 33-point manifesto for changing the world, or at least your office.

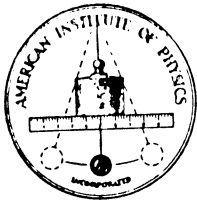
It's not rocket science, says Mr. Schmidt, who earned his Ph.D. from the University of California at Irvine. Form a union, fight elitism, and "undermine management's information advantage."

Sound like hard work? You're already doing it. For laborers in academe, Mr. Schmidt recommends reading "the weekly intelligence report for university bosses," *The Chronicle of Higher Education*.

—D. W. MILLER AND JEFF SHARLET







A I P Inter-Office Memorandum

To: The Advisory Committee & Dr. H. Davis

Date: 11 October 1983

From: Physics Today Staff

Subject: Luncheon

We regret we will not attend today's lunch. Because we are no longer included in the day's substantive discussions, we do not feel it is appropriate for us to attend the day's more social event. We are sorry to inform you so late, but we had been waiting for a definite invitation to be made.

Jean Coonan  
Daniel Gladstone  
Jay Iorio  
Jean Knight  
Elliot Plotkin  
Jeff Schmidt

Bertram Schwarzschild (Although agreeing with the sense of this note  
I will attend the lunch.)

When I was asked, informally, to join the Advisory Board of Physics Today for lunch, I was not aware of the staff dispute that took place during the board's meeting last year. Nor was I aware of the traditional practice of staff participation at the meeting. Since accepting the invitation to lunch, I have been informed of the issues raised by the staff last year and considered these to be important and clearly in the interest of improving the magazine. Accordingly I understand the frustrations of many members of the staff and consider their action, under the circumstances, both dignified and understandable. While I do not share in their action, I would want it known that I register my concern with their legitimate grievance in the interest of staff solidarity.

Irwin Goodwin



Thursday, October 27, 1983

NOTES RE: GENERAL PROBLEMS WITH PT MANAGEMENT

- 1- COPYFLOW - Major difficulties exist in the copyflow and cause repeated problems in all departments. A key issue seems to be that no one person is responsible for copyflow and items now routinely back-up on managing editor's desk.
- 2- DELEGATION OF RESPONSIBILITY - the staff is not given the necessary autonomy over the tasks that are delegated to them. This results in:
  - A- Repeated and persistent meddling that is both time-wasting and demoralizing.
  - B- Constant supervision over job details, which in addition to being time-wasting and demoralizing, also reduces the overall quality of the magazine by not using the skills of the staff members.
  - C- Taking over staff members responsibilities - This includes removing work from an individual's desk without discussion, permission or usually notification, signing-off staff members names on forms, making changes and adjustments of all types without consultation.
  - D- Idiosyncratic editing and adjustments to artwork and lay-outs, due to personal preference and lack of trust in staff judgement.
- 3- KEEPING STAFF INFORMED - this dramatically effects not only staff morale, as it reinforces the general perception that they are not seen as a valuable & responsible part of the magazine, but also leads to errors, time being wasted, duplication of effort and aggravation for managers.
- 4- WORK FLOW - this is a problem for all of the staff, but is perhaps worse for the secretaries and the production staff. They are not kept informed, or given consideration when work is coming at the same time from many people, as is common in a monthly magazine. Again there is no one person who is now responsible for the work flow, both for keeping it moving smoothly and for dealing with problems as they arise. This causes needless difficulties for the production staff who tend to get all copy and all art work in the last few days before the paste-ups are due.

- 5- NO RECOGNITION FOR VISUAL ASPECT OF MAGAZINE - The visual part of the magazine is given short shrift in PT. Instead of being viewed as a vitally important part of communicating the editorial material, frequently the artwork is merely placed as filler between stories as opposed to being used as illustrative material or to excite interest or yield new information.
- 6- NO RECOGNITION OF THE VITAL IMPORTANCE OF STAFF INPUT TO THE CONTENT OF THE MAGAZINE - Needless to say this is perhaps the most demoralizing issue of all. On a staff of ten, to be uninformed about the contents of the coming issues, to have only the most limited of forums for offering ideas, and to have no exchange of ideas about articles, news, illustrations, covers, or anything else, is simply ignoring the available talent of the staff with negative consequences for staff morale and for the overall quality of the magazine.
- 7- NO SHARED OVERALL PERCEPTION OF THE DIRECTION AND GOALS OF THE MAGAZINE- This limits everyone's ability to branch out, come up with ideas, and to contribute their own view towards a common goal.



SECRET

DRAFT - NOT TO BE CIRCULATED

21 November 1989

Dr. Kenneth  
Ford, Director and CEO  
American Institute of Physics  
335 East 45 Street  
New York, NY 10017

Dear Dr. Ford:

DIDN'T YOU APPLY JUST AS YOU WERE STARTING WORK AT PT?

On ~~Friday~~ 17 November 1989 I finally received a correct "green" card <sup>documenting my</sup> for permanent US residency status <sup>for which I had been sponsored by AIP and for which I had</sup> ~~supplied letters of support from several astrophysicists familiar with my work as~~ associate editor at Physics Today <sup>had written letters of support.</sup> Theresa Braun, director of human resources, <sup>at AIP</sup> had gone with me (a Canadian citizen) to have AIP hire an immigration lawyer to adjust my status from a temporary H-1 visa. <sup>Around</sup> ~~the~~ <sup>the</sup> time that I received approval in August 1988, Braun said ~~that~~ <sup>that</sup> she hoped I would not then leave my position at AIP. (I had started work ~~as an associate editor~~ at Physics Today in September 1986.) ~~But~~ I had no intention of leaving Physics Today. I felt I could make a significant contribution in reporting on ~~news about~~ <sup>exciting developments in astrophysics</sup> to the wider physics community. In addition to writing for <sup>the magazine's</sup> Search and Discovery <sup>department</sup>, I edited feature articles and <sup>served</sup> ~~acted~~ as book editor, as well as doing other routine duties <sup>such as reviewing manuscripts and letters</sup>.

The fact that I am no longer listed as associate editor on the masthead of Physics Today is drawing some comment: In a letter to me, <sup>Donald</sup> ~~Dr.~~ Osterbrock, president of the American Astronomical Society, writes "I was surprised and shocked to learn that you no longer are on the staff of Physics Today. You did an excellent job, and they will miss you very much." Another wrote: "please let me know if I can help in any way." But they would be even more surprised and shocked if they knew the bizarre circumstances <sup>under</sup> ~~in~~ which I was "terminated with AIP," in the words of Braun, to <sup>preserve</sup> "AIP integrity," in the words of John Rigden, director of physics programs, who oversees the Physics Today operation.

In July, <sup>while</sup> I was attending a workshop in Santa Cruz (for which in November I received a check from AIP to cover my expenses there and equivalent round-trip airfare New York-San Francisco), <sup>when</sup> I was told <sup>by telephone</sup> that I had been "terminated with AIP" some days previously, <sup>evidently</sup> while I had been driving through Colorado on my way to Santa

DO NOT PUT  
"APPROVED" IN QUOTES  
THAT WAS THE WAY PLANS  
WERE APPROVED.

9  
Cruz. My crime? <sup>supposedly</sup> Leaving without authorization. However, I <sup>had</sup> left at the end of April for four weeks the same way I left at the end of June. Both times I discussed my plans with both the editor Gloria Lubkin and the managing editor Peter Brown. No action was taken against me in May. Three <sup>(?)</sup> weeks prior to my travel at the end of June I had submitted a detailed itinerary, and Lubkin had approved it in the usual, although peculiar, way that she had always approved such plans for me and for other members of the Physics Today staff -- by raising no objection prior to the date by which the staff member had to make travel arrangements. Three others, including the managing editor Peter Brown, have left Physics Today in recent months. <sup>This represents the loss of a significant fraction of the magazine's</sup> ~~These four (including myself) represent 1 in 3 leaving the editorial staff of Physics Today.~~ None of the three had <sup>remained</sup> been on staff more than <sup>18 months</sup> ~~12 years~~. Is there low morale at Physics Today? As you, Dr. Ford, very well know on AIP's employee survey in the fall of 1987, <sup>the Physics Today staff gave the editor (Lubkin)</sup> ~~gave~~ a shockingly low evaluation of the ~~editor (Lubkin) by the PT staff.~~ (The three who left recently did not participate in the survey; <sup>having</sup> they joined the staff in 1988.) I estimate that about 20% of my normal working time was wasted ~~in~~ dealing with the consequences of the editor's indecision, poor editorial judgment and mismanagement of the Physics Today operation. <sup>(tr)</sup> In any case both Rigden and you have told me that you are aware that there are management problems at Physics Today.

Because of other resignations and a failure at Physics Today to distribute workloads equitably, my workload (particularly article editing) was becoming unreasonable: I was working evenings and weekends, yet I could no longer claim to report on astrophysics adequately for the Search and Discovery news section. I was the only associate editor at PT trained as an astrophysicist. I submitted a resignation letter <sup>on</sup> 15 February 1989 <sup>with</sup> citing unacceptable workload and salary, with resignation effective 15 April. ~~AIP recommends giving a two-week notice.~~ Braun told me that AIP wanted to have me stay and that it was the responsibility of the managing editor to make sure that the staff members had the resources to do their jobs. Still having had no response on either workload or salary by 15 April, I extended my deadline to the end of April to show good <sup>faith</sup> ~~will~~ on my part and informed AIP I was leaving for <sup>a month</sup> ~~an extended period~~ <sup>of well-earned vacation.</sup> Finally, near the end of April, Brown proposed workload figures for me and agreed to recommend that I <sup>receive</sup> ~~have~~ a special review to get a salary adjustment; Lubkin ~~also~~ supported this recommendation. Upon my return, I was told that Rigden and Braun had rejected a special review (as they did not want to set a precedent for other staff members). Instead I was offered "pie-in-the-sky" by Rigden -- a salary adjustment at my next regular review, which is what everyone gets as a matter of course. It had taken nearly <sup>four</sup> ~~three~~ months for management ~~and~~ <sup>personnel</sup> to come up with this statement! I then made a handshake agreement with Rigden that I would remain on staff at least until early October, ~~until then~~ accepting Brown's workload figures provisionally, and then at that time I would evaluate the

PERSONNEL IS PART OF MANAGEMENT; THEY WOULD LIKE US TO THINK IT IS NOT AND THEREFORE CAN BE TRUSTED

salary recommendation and the review, which was scheduled for late September 1989. By the end of June I had made sure that my workload as book editor was completed for the next three months, I had already exceeded the workload figures on article editing for the entire year, and no news story for Search and Discovery was pending. I made a simple request to Braun that the salary adjustment to be made in September be made retroactive to 15 April 1989, the date I had given in February as my resignation date, the date beyond which I would not work at AIP with my workload and salary as of February. In Santa Cruz in July I was informed by Braun that it was "inappropriate" for her to respond to this request. Why? By late June I had

become thoroughly disgusted with the stalling by AIP ~~management and personnel~~.

OR  
SEMI-  
COLON

~~It was~~ <sup>They were</sup> not being forthcoming. I decided to ask to go to Santa Cruz for a workshop on Supernovae and to take more vacation days <sup>and</sup> I had had none <sup>vacation</sup> in neither 1987 nor 1988. ~~Also I wanted to take~~ three weeks leave Braun in February had approved in principle my taking up to three months leave. I discussed my plans in outline with Lubkin and in detail with Brown. <sup>As I mentioned above,</sup> ~~They did not reject my plans;~~ <sup>raised no objection</sup> Lubkin only expressed surprise that I had so many vacation days accumulated. As far as I was concerned I had tacit agreement to leave just as I had had at the end of April.

Yet, Braun blamed me for not getting authorization to leave. ~~But~~ <sup>As I see it,</sup>

~~AIP personnel and~~ AIP management just cannot get its act together. Furthermore, ~~in order~~ to preserve "AIP integrity" as Rigden termed it, Rigden broke his own agreement with me. (I ~~have~~ <sup>discussed</sup> all this in person with Rigden in September upon my brief return to New York.) How is it possible to maintain the integrity of an institution if the <sup>managers</sup> ~~management~~ of that institution do not individually have integrity?

The last sentence of a feature article in the August 1989 issue of Physics Today says it well: "Institutions are not important, but people are." Apparently AIP management does not believe this statement. Rigden is well aware that I have received very favorable comments for my work as associate editor at <sup>Physics Today</sup> ~~PT~~ both from outside AIP and from inside AIP (for example my second annual performance review from fall 1988). Why should I be <sup>punished</sup> ~~blamed~~ for the inadequacies of Lubkin, Brown,

Braun or Rigden? I have done much, much more for AIP and PT than they could reasonably have expected. I have bailed out the editor and the magazine several times from the consequences of the editor's poor judgment and ~~the~~ <sup>mismanagement</sup> of the Physics Today operation. (I am now preparing a <sup>much longer document</sup> ~~very long letter~~ that ~~will~~ <sup>discuss</sup> in detail many of the problems I have experienced in trying to work effectively in the chaotic circumstances of the Physics Today operation.)

DO NOT  
OVERESTIMATE  
BRAUN'S  
AUTHORITY.

In short, the action the AIP management took against me in early July was unwise and invalid. I am asking you, Dr. Ford, to reconsider what was done. (As you



know, I sent copies of my letters and memos to both you and Robert Baensch,  
 director of publishing, throughout the period February to June 1989.) If you  
 do (not choose) to reconsider the action taken against me, then you are sending a  
 peculiar but strong message to the remaining staff members at Physics Today:  
 namely that AIP management <sup>is</sup> and ~~AIP personnel are~~ deceitful and cannot be trusted.

Finally, I have been advised to launch <sup>legal</sup> ~~a grievance~~ action against AIP. I did  
 not come to the <sup>US</sup> to be unemployed or to go on the dole. <sup>United States</sup>

Yours very truly,

*Per H. Andersen*

Per H. Andersen

cc: R. Baensch, director of publishing



SUGGESTED MEMO TO  
JOHN RIDEN.

DISCUSSED AT MEETING OF MATT, JESSE,  
BERT, ME, JEAN, ELLEN AND BILL, 24 JAN, 91,  
TAIPEI RESTAURANT.

We are concerned about Physics Today's perennial schedule problem, and we would like to discuss it with you on Tuesday. 29 January. when you meet with the Physics Today staff. But we feel that the schedule difficulty is just one symptom of the poor organization and low morale at Physics Today, and cannot be solved in isolation. as has been attempted in the past. If you decide to discuss the schedule with the staff, we urge you to focus on the underlying problem that many of us have brought to your attention in the past. both directly and through Darlene Carlin -- namely, the flawed managing style of our editor. Her disrespectful and frequently abusive treatment of staff members, her failure to communicate clearly, her obstructive strategies and procrastination on matters of staff concern. her wasting of the staff's time by making irrational requests, and her reliance on safe, visionless solutions to every problem. create a working environment in which staff members are dispirited and resentful. It is hard to imagine that new office procedures will overcome these difficulties.



## Physics Today Memorandum

To: Steve Benka, Editor  
From: Jeff Schmidt  
Subject: More articles to edit  
Date: 25 May 1995

A few months ago I told you that this year I wanted to edit more articles than I edited in any of the past few years (the years since the magazine established its current standards of quality). I am writing to remind you that if this is to happen, I will need your help. Specifically, I will need more articles that are ready to edit. I have run out of articles two times in the past ten weeks. (The first time was before the arrival of the article I edited for the May issue, and the second was after I finished editing an article for the June issue but before my July manuscript arrived.) Let me emphasize that I am not asking for more articles in the solicitation stage. As you know, I already have been given a big, time-consuming load of those works-in-progress, many of which I will eventually edit, after they have been submitted, reviewed, revised and accepted.

In a related matter, at the staff meeting of 27 April 1995, Managing Editor Ken McNaughton raised the issue of my workload. The main topic of that meeting was the staff's concern about the increasing workload here at Physics Today. I am sure you recall that when I spoke strongly on behalf of the staff, McNaughton responded with an angry personal attack, saying that I haven't done more work. His message was clear: "Who are you to speak for the staff about increasing workloads when you haven't increased your own." Over the years I have regularly discussed the quantity of my work with supervisors, as employees normally do, but this marks the first time a manager has become angry about it.

In summary, I would like to have a surplus of articles ready to edit, rather than the shortage that I have usually had, and I would appreciate anything you can do to make this possible.

A handwritten signature in cursive script, appearing to read "Jeff", followed by a long, sweeping diagonal line extending from the bottom right of the signature.



15 November 1996

Proposals for discussion at Physics Today retreat

The following proposed agenda items are in the spirit of Steve's invitation to put our concerns "on the table." This list was put together by some of the staff, based on discussions among staff members. The theme of these proposals derives from the main points raised by the Physics Today advisory committee: openness, staff empowerment and editorial efficiency. The proposals address issues that are very important to at least some of the staff, and they are intended to provide a basis for discussion. Each proposal is subject to adoption, modification or rejection during the retreat. PLEASE ADD TO THE LIST.

1. Agreement that we want to keep all the present staff members.
  - Security is a prerequisite for speaking freely, sharing ideas and experimentation.
2. Openness.
  - Recognize that all staff members are legitimately concerned about all aspects of the magazine -- both content and process.
  - Proposed changes in magazine's content or process should be announced to the staff and discussed.
  - Make letters to the editor available to all staff.
3. Volunteer reporters -- a staff-based information system.
  - Reporter gathers and disseminates information on progress toward agreed-upon goals. Not intended to replace management's information system. (Example: reporting on progress toward hiring someone to categorize books.)
4. Problem resolution: Editorial and other.
  - Editorial judgment: Burden of proof on critic.
  - In disputes, staff members are encouraged to consult others on staff.

5. Distribute work according to staff interest.
  - Adjust job descriptions of yet-to-be-hired editorial and secretarial staff members based on current staff interests.
6. Physics Today management should act in a way that leads staff to see them as their advocates rather than as the local representatives of higher management.
  - Advocates in editorial controversies.
  - Advocates in annual reviews.
7. Voluntary staff participation in hiring.
  - Participate in writing job advertisements.
  - Examine resumes.
  - Talk to candidates.
  - Offer recommendations.
8. Take affirmative action to increase diversity of Physics Today staff.
9. Allow staff to solicit outlines for articles.
10. No need for detailed schedules.

(Distribution: All PT staff and managers.)



22 Oct. 96

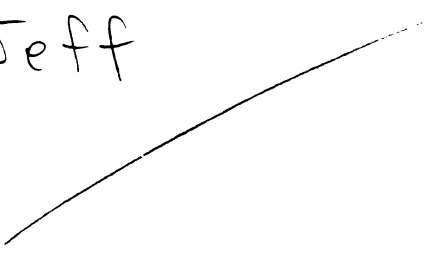
Graham —

Please add these two items to the agenda  
for Thursday's meeting:

- Staff participation in hiring
- Need for additional staff

Thanks,

Jeff



**From:** Jean Kumagai <jak@interport.net>  
**To:** ACP.AIP(pelliot,tfeder,jschmidt)  
**Date:** 22 Oct 1996 (Tue) 16:50  
**Subject:** Re: Meetings

>  
>To:Graham Collins <gcollins@aip.org>  
>From:jak@interport.net (Jean Kumagai)  
>Subject:Re: Meetings  
>  
>Hi, Graham  
>  
>I'd like to add two items to the staff meeting agenda on Thursday:  
>  
>First, I think we should include in the discussion of Ray's departure the  
>staff's participation in hiring.  
>  
>Second, we should discuss our need for additional staff.  
>  
>Also, can we get a summary of the advisory committee's preliminary  
>feedback before the meeting?  
>  
>Thanks,  
>Jean  
>  
>  
>  
>



**From:** Toni Feder  
**To:** GCOLLINS  
**Date:** 23 Oct 1996 (Wed) 8:57  
**Subject:** mtg

Hi Graham,

Agenda items for Thursday's meeting:

I think we should discuss staff participation in the hiring process, as well as the need for increasing staff size.

Thanks,  
Toni

**From:** Graham Collins  
**To:** TFEDER  
**Date:** 23 Oct 1996 (Wed) 10:13  
**Subject:** mtg -Reply

You've been talking to Jeff and Jean, haven't you?

OK, I'll add it.

I apologise again about how Carol told you that you were now doing the books screening. If you had been around last week when Ray and I discussed it we would have immediately gone to you to discuss it as a proposal. Instead we reached the conclusion that there really didn't seem to be any other workable option. My intent was to raise it with you as a proposal, with the expectation that we would reach the same conclusion. And I thought I had made it clear to Carol that because I hadn't yet discussed it with you, she shouldn't raise it with you yet.

-- Graham



"Gag order"

REC'D, 1 OCT. 97

Jeff,

We welcome constructive and productive contributions from you, but behavior by you that we consider destructive and counterproductive will no longer be tolerated. Your continued interruption at our retreat, after you were instructed to hold your questions and comments until the discussion segment of the agenda, is an example of what we mean. The continuation of such behavior on your part, in the office or at any work-related activity, will not be tolerated.

This notice is to be treated as confidential.

cel  
9/24/97



17 October 1997

Dear Members of the Physics Today Advisory Committee:

Some members of the Physics Today staff urge you to spend part of today looking into a matter that has become of deep concern to us since the last Advisory Committee meeting and especially in the last few months.

What concerns us is the increasingly repressive work environment at the magazine.

Please use the brief account that follows as a basis for confidential discussions with staff members. We are confident that you will be able to corroborate its fundamental points.

We regret having to be the nonundersigned here, but in the year since the last Advisory Committee meeting, we have been increasingly subjected by management to verbal abuse, direct threats of dismissal and warnings about speaking out in front of both Physics Today managers and others outside of Physics Today.

Please keep this memo -- but certainly not the topic -- within the confines of the Committee.

-----

#### Freer Atmosphere Needed at Physics Today

At Physics Today there is an increasingly repressive atmosphere that discourages staff initiatives to improve the magazine and that discourages creative work.

Events before, during and after the 25 September 1997 staff retreat have contributed to the problem.

In July, Marc Brodsky held a meeting with the Physics Today staff, apparently to hear what we had to say about present conditions. During the meeting, Graham Collins brought up a number of problems; some needed changes were made as a result. However, within a few days of the meeting with Marc, Graham was lectured at length by Charles Harris, who repeatedly stated how important it is for the staff to "speak with one voice." The message was quite clear: Do not complain.

In subsequent conversations with other staff members, Charles reiterated the call to "speak with one voice" when dealing with AIP upper management and, interestingly, with the Physics Today Advisory Committee.



A month before the retreat, Steve Benka and Charles Harris invited the staff to suggest topics for discussion (as they had done at last November's retreat). Many of us did so enthusiastically. One evening several days before the retreat, Charles rounded up several of the editors who happened to be in the office, to present his version of the retreat agenda. To the surprise and disappointment of those present, none of the major suggestions put forth by the staff was on it. Instead, the eight-hour retreat was to lead off with three and a half hours of reports on what each department in the magazine does. Several people argued that, rather than sitting through such presentations, everyone's time might be better spent discussing problems and solutions.

The following day, Charles issued a slightly revised retreat agenda to the entire staff. As before, a number of people (including several who had been excluded from the ad hoc after-hours meeting) objected to the departmental reports, and asked that the staff's suggested agenda topics be included. But Charles refused to change the agenda, and he grew increasingly angry with staff members who tried to discuss the agenda with him -- even though he had invited us to help set the agenda in the first place.

After setting such an uninspiring agenda, Charles declared attendance at the retreat mandatory for all editors. In contrast, attendance at the previous retreat had been optional, yet everyone had attended; we had been inspired to attend by the feeling that the meeting really was an opportunity to make a difference.

At the 25 September retreat, Charles Harris and Steve Benka spoke first, saying some provocative things about the magazine's organization, mission and content. When they finished, Jeff Schmidt asked if we could ask questions, and Charles said no. This was a surprise to all of us, especially because of our assumptions about the nature of retreats. Jeff suggested that we should be allowed to ask questions. Charles said that the agenda permitted questions "later." Another staff member, not finding such an item on the written agenda, asked where it was, and Charles repeated himself, saying only that it was there, "later." ("Later" never came.) When Jeff tried to say something, Charles demanded that Jeff be silent, repeatedly shouting, "That's an order! That's an order!" Charles's outburst stunned the staff, and some later commented that they felt like resigning.

During the departmental reports that followed, a few staff members departed from their prepared text to criticize Charles for his behavior; others agreed but were too afraid to say so openly. As a result, Charles adopted a somewhat more open attitude.

After the retreat, however, Charles lectured Jeff (a physicist in his 17th year as a PT editor) on how to follow orders, and gave him a written notice that called Jeff's

questioning of the surprise no-questions policy an "interruption." The notice strongly implied that Jeff would be fired the next time he says anything that Charles considers to be "counterproductive." This notice amounts to a gag order, because no one can know for sure what Charles might consider to be counterproductive. Though directed at Jeff, the gag order by extension applies to all of us; the chilling effect is already evident.

Both Jeff and Graham have been outspoken about problems that many of us see at the magazine. We feel that the lecture to Graham and the written notice to Jeff both contribute to a repressive atmosphere at the magazine and restrict all of us. We hope the advisory committee will do whatever it can to get these warnings retracted, and to remind the PT managers that repression is counterproductive. Such steps would go a long way toward diminishing the fear that staff members now associate with trying to openly address problems at the magazine.



# Report of meeting at which staff got management to agree to rescind both gag orders

**From:** Charles Harris  
**To:** pt  
**Date:** 1 Dec 1997 (Mon) 18:16  
**Subject:** November 1997 Monthly Staff Meeting

This memo summarizes what we discussed at the meeting, with emphasis on the major topics discussed, conclusions reached, and action items agreed upon.

It's an effort to maintain communications and reduce misunderstandings among us, help keep us on track in terms of what we--individually and collectively--say we're going to do, and inform the PTers who weren't at the meeting.

I (or a volunteer) will prepare the same kind of summary memo after each of the subsequent monthly meetings. At the next meeting, let's discuss the usefulness of such memos, and whether this basic form should be modified.

## TOPICS DISCUSSED

The principal topic we discussed (as agreed to at the outset) was communications.

Gloria led off the discussion by stating that the staff needs to know what's being planned and done regarding such matters as staffing, budgeting, management policies and plans that affect PT, and the member societies' attitudes toward PT.

Her remarks prompted discussion of the staff's involvement in the planning of the editorial calendar. Some people felt that the editors should be more involved in the process. I said I had no problem with that.

We then turned to the matter of staffing. Points made included the following:

- o PT currently has a tight budget that does not call for either staff expansion or staff reduction.
- o Some relief could be obtained by allocating some of Rita's salary to TIP and advertising (as is already done with mine and Carol's).
- o Rita currently has too much work to do, and needs relief. We briefly discussed ways of providing Rita -- and also Susan and Carol -- with assistance, but no specific decisions were explored.
- o Ray Ladbury will be writing Search stories on a part-time basis and as a part-time employee. His involvement will not increase the number of Search stories we run, in that Barbara and Gloria will be writing fewer Search stories for a while as they concentrate on other things. Nor will Ray's involvement have an impact on our freelance budget.
- o I noted that our current freelance budget is about \$22,000, and we discussed the possibility of using it in part to pay for the services of an outside copyeditor. One suggestion made was to use such a person to relieve Jean of her copyediting duties.

There followed an extended discussion of staff communications, specifically what I should communicate to the staff, when I should do so, and in how much detail. Points made included the following:

- o How much detail? The issue was left unresolved, but one suggestion was that in some cases the staff simply needed to be informed that a matter was under consideration.
- o I said I would provide the staff with more information than I have, but that I would continue to withhold certain confidential materials.
- o It was suggested that PT managers should trust the staff more, as well as provide information sooner and better (as could have been done vis-a-vis the contents of the special issues decided last spring). It was also suggested that the staff can contribute to what PT managers are doing (for example, with regard to the APS task force).
- o I volunteered to do a better job of communicating with the staff, and one of the ways I will do so -- with Carol's help -- is by making more use of our e-mail system. I also invited the staff to follow up with me on specific issues they have raised with me. In addition, I said I would arrange to have e-mail access to PT when I'm off-site (something I don't have now).

o We briefly discussed the "firewall" approach to management, under which managers try to shield staff from higher management.

o In terms of the APS task force to evaluate PT, I said that I have learned who's on the task force and will share that information with the staff. I also noted that my goal is to fend off outside influences on PT and PT editors, and Marc Brodsky supports that position.

o We engaged in an extended, open, and either spirited or acrimonious (take your pick) discussion of the dual issues of free speech and the basic rules of conduct, as well as the related events and difficulties that we have experienced over the past two months. In this case, we did reach agreement: That we will put the past behind us and stop exchanging accusations and counteraccusations; that we will abide by the basic agreement we had reached at our first monthly meeting, on 15 October, regarding rules of conduct, as slightly modified at this meeting (see below); and that this modified code of behavior supersedes all else on this subject that PT managers have communicated, formally and informally, verbally and in writing, to all or some members of the staff. I individually polled all of us present, in person or on the phone (absent were Bert, Irwin, and Steve), and we all agreed to abide by this arrangement. (In addition, I said I would send private memos to Graham and Jeff to rescind earlier directives.)

#### CONCLUSIONS REACHED

1. I will try to keep the staff better informed, with Carol's assistance, and will use e-mail more as a means of staff-wide communication, along with our regular monthly meetings.

2. Our agreed-upon code of behavior -- for staff and managers alike -- is that all of us will be respectful, tolerant, and courteous in dealing with one another, and that we are free to engage in constructive criticism and discussion without fear of retribution.

#### ACTION ITEMS

1. I'll communicate better, and also get myself equipped with remote e-mail access.

2. I'll send the staff a memo about the APS task force members.

3. I'll give private memos to Jeff and Graham as promised.

4. We'll all abide by the code of behavior.

5. We'll meet again for our third monthly meeting, on Monday, 15 December, from 10 a.m. to noon.

# Rescindment of gag order on coworker Graham Collins

**Subject: FYI: rescindment**

**Date: Wed, 03 Dec 1997 09:48:35 -0500**

**From: "Graham P. Collins" <gpc@sff.net>**

**To: jak@interport.net, ar429@lafn.org, tfeder@wam.umd.edu, lugenbold@juno.com**

FYI, here is how CH & SB rescinded my gag order. It came from CH's account, with the name in the From field changed to include both their names.

>>> Charles Harris, Steve Benka (Charles Harris) 12/02/97 12:27pm >>>

>

>\*\* PRIVATE \*\*

>

>As agreed in the last staff meeting, our mutual acceptance of a code of  
>behavior supersedes any outstanding verbal or written reprimand to you  
>or any member of the staff for any perceived violation of this code.  
>Onward and upward!

About 45 minutes later, I replied with the following (to both CH and SB, including a copy of the above message).

>Thank you.

>

>(The contentious part of the reprimand in question related to a violation of  
>a different, previously unstated code, but I'll accept this statement in the  
>spirit intended.)

I suspect that they labored mightily over the wording of the rescindment (it did, after all, take them nearly 3 weeks), and yet they got it wrong. I shake my head in dismay.

-- Graham

# Rescindment of gag order on me

**From:** Charles Harris, Steve Benka (Charles Harris) (Charles Harris)  
**To:** JSCHMIDT  
**Date:** 2 Dec 1997 (Tue) 12:30  
**Subject:** rescindment

As agreed in the last staff meeting, our mutual acceptance of a code of behavior supersedes any outstanding verbal or written reprimand to you or any member of the staff for any perceived violation of this code. Onward and upward!





27 April 1998

To: Theresa Braun, Director of Human Resources, and James Stith, Director of Physics Programs, American Institute of Physics

From: Jeff Schmidt, Senior Associate Editor, Physics Today

Subject: My 1998 performance review

I am writing to ask that my 1998 performance review be redone. Physics Today editor Stephen Benka wrote the review under the direction of Physics Today publisher Charles Harris. I discussed the review with Benka, who, after consulting with Harris, refused to make any of the revisions that I requested. Therefore I am appealing to you to produce a new review.

The review was not conducted in accord with American Institute of Physics policy or procedures, and the result is not a fair assessment of my work as a feature articles editor at AIP's Physics Today magazine. I am asking you to produce a new review not just in the interest of accuracy, but also as a necessary affirmation that in the future the American Institute of Physics will treat its employees fairly.

The review lowers my performance rating from last year's "4" ("Exceeds Job Requirements") to a "3" ("Meets Job Requirements") even though this year I did more work and more innovative work. Producing feature articles for the monthly magazine is a team effort, and I think that the many staff members with whom I work will testify that my work is better than average.

The biased review that I received is punishment for my organizing activity at the magazine. It is one of a number of recent reprisals for -- and moves to stop -- such activity, in which I have played a leading role in the interest of both the magazine's staff and the physics community. The central retaliatory feature of the review is that it makes what it admits are "new demands," which amount to a sharp increase in my workload.

I have had 17 performance reviews since I began working at Physics Today in March 1981, but until now I have never needed to write a response to one. This time, however, not only is the review inaccurate, but my supervisor, editor Benka, presented it to me with the attitude that performance reviews at AIP are not done with employees, but are done to them. This violates both the letter and the spirit of AIP policy. He acted as if he were not permitted to change the review in any significant way, and so his discussion of its contents was only pro forma.

In this memo I will first describe some of the ways in which the review is inaccurate, and then I will explain how

it is a reprisal for my organizing activity and part of a series of recent attempts to stop me from engaging in any further collective activity at the magazine.

### Review inaccurate

I will go over every sentence of the performance review and show how the review plays down or completely leaves out my accomplishments while contriving deficiencies and playing them up. The review has four sections: three sections focusing on my major areas of work responsibility and one section of additional comments.

### Article editing

Concerning my article editing work, the review states that "Jeff's articles are generally ready on time and are often early." This plays down my accomplishments and does so deliberately, because management keeps records of deadlines and work-completion dates and is fully aware of what I have done in this regard. The words "generally ready on time" must be changed, because my articles were always ready on time and never delayed an issue of the magazine. And the words "often early" must also be changed, because my articles were almost always early and were often very early.

This is not to say that management can reasonably hold me responsible for the final completion dates of the articles that I work on. They cannot, because the publication process depends upon the work of the magazine's editor and many coworkers, over whom I have no authority. What my review should note is that I always did my part as fast or faster than can reasonably be expected, and certainly much faster than average. At one point during the year, for example, I had two feature articles ready to go to the printer more than a month before the deadline (discussed further in the following two paragraphs). As far as anyone can remember, this had never been accomplished before at Physics Today. My articles came close to the deadline only when the editor failed to meet his deadline for obtaining the articles and giving them to me to edit. I ask that you rewrite this part of my performance review and increase the numerical rating to reflect the resulting more accurate appraisal. I am asking you to do this not just to make my review more accurate, but also to assert that it is not AIP policy to begrudge an employee praise when it is due, even if AIP has a grudge against that employee.

On the issue of deadlines, I would like AIP to use its own performance as the standard for comparison. AIP gave me my performance review more than five weeks late, missing its mid-February deadline and then not even completing the review by the middle of the following month. Benka dated my review 12 March, signed it on 23 March and gave it to me on 24 March.

One big reason that I did more work this year than last year was because management stated that it wanted the magazine to have a backlog of feature articles that were edited and completely ready to be sent to the printer. I supported this goal and produced such articles, but this unprecedented accomplishment is not mentioned in my performance review. Management is fully aware of my accomplishment, as evidenced by the fact that they praised it at a staff meeting.

Working way ahead of the deadline has the potential advantage of avoiding some major inefficiencies (described in the following paragraph), but doing so turned out to involve extra work, because although management asked for and praised the result, they did not support the effort while it was underway. It was left to me to bring about the changes in the workplace necessary to work ahead. The editor consistently maintained a crisis mentality, always giving priority to work for the next issue -- which he always worried would be late -- over work for future issues. Because the work of most employees on a forthcoming issue doesn't end until around the time that the issue goes to press, the editor, with his crisis priorities, never deemed it reasonable to work on later issues. I was able to accomplish management's goal of completing work ahead of schedule only by working directly with the staff team that actually does the work (Rita Wehrenberg, editorial assistance; Paul Elliott, copy editing; Elliot Plotkin, art work; Judy Barker, proof reading; Carol Lucas, photo permissions), and carefully avoiding coming to the overly insecure editor with questions of work priority. I ask you to add this accomplishment to my performance review and raise the numerical rating to reflect the resulting less biased appraisal. I ask you to do this not only to make my performance review more accurate, but also as a way of saying that AIP does not condone biased appraisals of employees.

Another big reason I did more work this year was the inefficiency caused by the magazine's periodic exhaustion of its supply of feature article manuscripts that are ready to edit for publication. It is Benka's responsibility to obtain articles for the magazine. The shortage of articles resulted in a very uneven work flow and forced me to edit some articles close to the deadline, which often meant editing in parallel with the author's making revisions. It is easy for the editor to say "just work in parallel," but such work often necessitates reediting material that the author changes and discarding edited material that the author removes, and a host of other problems. The shortage of articles led me to write to the editor in the middle of the year asking for more work. (See attached memo of 18 August 1997.)

The numbers given in the performance review are all wrong. The review says that this year I "was asked to produce 16-18 articles." In fact, the agreed upon rate was initially 16 per year, not "16-18," the precise meaning of which is not at all clear since there presumably is no upper limit. Benka and I later in the year agreed to reduce the annual rate to 14 and increase the amount of work that I do in areas other than editing, yet the number "14" never appears in my performance review. I ask you to correct this.

As far as the article editing part of my job goes, my production rate is supposed to be measured by the number of articles published in the magazine in the issues March 1997 through February 1998, as is written at the top of the review form. During that year I edited 13 articles (Mahan, Ferguson, Crabtree, Crowley, North, Parsegian/Austin, Harris, Soulen, Libicki, Perl, Ross, Riordan, Mourou), one of which (the Parsegian and Austin combination article) should count as more than one because making it happen involved a lot of extra work. (More about that article below.) Although this is less than the agreed upon goal, it should be deemed acceptable because of the shortage of articles (AIP should not hold employees responsible for doing work that is not available to do) and because of the extra work caused by that shortage and by management's lack of support for working ahead. Please correct the accounting in this part of the review.

The review gives an incorrect reason (a personal reason) for the mid-year change in my job description. The reduction in my article editing goal from 16 to 14, and the corresponding increase in my work following up with authors on articles that have been solicited, was prompted by the magazine's shortage of articles. On 18 August 1997 I gave Benka a note (attached) asking for more articles to edit. On 19 August 1997 he answered with a very defensive note (attached) blaming me in part for the magazine's shortage of articles and at the same time denying that there was any such shortage. He claimed that I was in part to blame, because following up on solicited articles was part of my job. On the same day (19 August 1997) Benka secretly altered my job description, adding truth to his claim that solicitation follow-up was a significant part of my job. When I discovered the change, he and I discussed it and I agreed to make solicitation follow-up a bigger part of my job. I asked him to write me a note saying that my job description had been changed (see 25 August 1997 note from Benka, attached).

The change in my job description, while made official in the middle of the year, should be considered retroactive to the beginning of the year, because the problem it addressed was long-standing and I had long before addressed it on my own: The shortage of articles to edit had already

led me to shift some of my work from editing to solicitation follow-up. Solicitation follow-up is an area in which I make valuable contributions to the magazine. This often time-consuming work includes giving feedback to authors and working closely with them to develop greatly improved articles for the magazine.

Finally, on 2 September 1997 I gave Benka a note (attached) explaining that solicitation follow-up was not the weak link in the magazine's feature article operation. That note, the contents of which Benka never disputed, is an important part of this appeal about my performance review, and as such, I ask you to read it. Please remove from my performance review the incorrect reason given for the change in my job description, and add a statement concerning the magazine's shortage of articles, because it played a crucial role in my work last year.

My work on the Parsegian/Austin combination article is one of many examples of how my performance review leaves out major contributions that I have made to the magazine (while carefully including minor, largely contrived, deficiencies). Physics Today was planning to publish in its July 1997 issue a manuscript by V. Adrian Parsegian of the National Institutes of Health, but the article received a highly negative appraisal from the magazine's external reviewer, Robert H. Austin of Princeton University. This caused a crisis, because the magazine had no article to substitute -- having completely run out of articles -- and because there was no time for Parsegian to make the extensive revisions that were called for by the reviewer.

Based on the nature of Parsegian's article, the nature of Austin's review and my confidence in the critical abilities of the magazine's readers, I suggested a solution: Publish the article and the review. This was unprecedented at Physics Today, but the editor followed my advice, in part because no other solution was apparent. I edited the combination article and review and handled the delicate and protracted negotiations between Parsegian and Austin, who did not trust each other. The solution was innovative, the result was outstanding and the magazine survived a crisis without damage. In fact, the result was better than it would have been had there been no crisis, because the crisis allowed the magazine to break with tradition. Yet the managers, who seem this year to have developed photographic memories for negative things (real or contrived), have completely forgotten about my special contribution to the magazine during the Parsegian crisis. I ask that my work on the Parsegian/Austin article be described on my annual review, as an example of my valuable advice and above-average work. And I ask that my numerical rating be raised to reflect the new, unbiased text.

You might think it strange that even though the review states that I edited enough articles during the year, it

lists the names of some articles that I didn't edit -- articles that were never assigned to me and that I was not expected to edit. That list appears on my performance review as a defensive measure by the editor -- to bolster his claim that under his editorship the magazine does not experience shortages of articles. Soliciting a sufficient number of articles for the magazine is the editor's job, and so the appropriate home for arguments that he has succeeded is the "Employee's Comments" section of his own performance review. Please remove the sentence and its negative connotation from my performance review. (For a discussion of how the list is not even what it claims to be, see the fourth paragraph of my memo of 2 September 1997.) Such lists do not appear on the performance reviews of other employees. The performance reviews of Physics Today news writers, for example, do not contain lists of the countless news stories that they could have written but didn't.

The review lists three articles that I edited (Perl, Crabtree/Nelson, Mourou) and claims that the quality of my work varied. In fact, because of my own standards I do a quality job on everything I do. There is, of course, no objective measure of the quality of editorial work. Articles are inherently different and hold a different appeal to different readers. In my performance review the editor implies that praise from authors is one measure, but he fails to note that we received praise from the authors of all three articles. Martin Perl, winner of the 1995 Nobel Prize in Physics, wrote to me and said "Thank you for changing my ugly duckling of a manuscript into a beautiful swan. You have done a wonderful job." I have attached a copy of his note along with a note from George Crabtree of Argonne National Laboratory praising our efficiency, competence and high production standards; Mourou delivered his praise in a telephone call.

It is true that the changes that Benka mentions making in the Mourou article were improvements that other staff members or the author might not have made at one of the later stages in the processing of the article. However, it is wrong to use this as the sole factor in judging the quality of work on the entire article, which would have been excellent even without Benka's improvements. And it is even more wrong to use it to judge an employee's entire year of work. Stephen Benka knows this. He knows, for example, that AIP management will not judge all of his excellent work on the Mourou article solely by the fact that he tried to introduce a mistake in the article's opening paragraph -- where he crossed out "30 angstroms" and wrote in "300 nm" and had to be corrected by the Article Editor. And he knows that his supervisors certainly will not judge his entire year of work in part by this mistake. He would see mentioning it on his annual performance review as petty, mean-spirited and sure to make team work impossible because it would give the impression that no error is too small for

the people that he works with to silently note and use against him months later. Please remove from my performance review the entire subjective sentence about the three articles.

### **Solicitation follow-up**

Concerning my solicitation follow-up work, the performance review understates the quality of my work and rates me only slightly above average. The only activity mentioned is that I "regularly nudged authors and reviewers whose items were pending." This is actually the smallest part of solicitation follow-up work. The biggest part, at least for the articles that I work on, is giving detailed feedback to the author and working with the author to develop a much better article. I often go way beyond the call of duty, taking extra time to work closely with authors to improve the final result. I am prepared to supply written evidence showing that my work in this area is exemplary. Please change the review so that it more accurately portrays my work in this area, and raise the numerical rating from the present stingy "3.5."

### **Advice**

Concerning the advice that I offer on editorial and other matters, my supervisors have suddenly (that is, within this review period) started looking for ways to prove that the advice I offer is bad. Coming up empty-handed, they have contrived two examples, one of which is a new, negative interpretation of advice I gave in an earlier review period. My 1998 performance review says, "Jeff's reviews of manuscripts have been completed more promptly than in the past, although they were somewhat less helpful." It is simply not true that my advice was less helpful this year. My comments on manuscripts often went beyond the minimum requirements and spelled out in detail what should be done to produce a publishable article.

As evidence that my advice is less helpful, the performance review gives only the following example, which is presumably my most deficient piece of work in this area for the entire year: "In his review of one Letter to the Editor, for example, he showed questionable judgement in his assessment of the physics competence of the authors of the Hubble Deep Field article (April '97)." There is absolutely no truth to this charge; its only value is that it reveals the bias of those who made it. I demand that my work on this letter be evaluated by an unbiased individual. James Stith, I would like you to be that individual, not because it is your job to handle appeals from Physics Today, but because your long-standing interest and expertise in physics education qualifies you to evaluate my work on this letter. All work on the letter was done in writing, and so you have a 100% complete record to review (attached). I challenge

you to find anything in my work on the letter for which I should be punished.

Here is a five-step summary of the facts of the case:

1. I edited an article by Henry Ferguson and two coauthors for the April 1997 issue of Physics Today.
2. Robert Weinstock, an emeritus professor of physics at Oberlin College, submitted a letter to the editor saying that he didn't understand how astronomers could look back more than half the age of the universe, as a photo caption in the article said. "This claim seems strange to me," wrote Weinstock, "for radiation emitted so long ago must have had its source so close to Earth at the moment of emission -- according to the generally assumed big-bang origin of the currently expanding universe -- that it would have reached Earth [long ago]." He ended his letter by saying that "If there is something wrong with my analysis, I shall be grateful to have it explained to me."
3. I thought Weinstock asked an intriguing question and that many of our readers would also be grateful for an explanation (and would value a magazine that gave them such explanations). Here, in its entirety, is my review of the letter: "I think a lot of our readers would appreciate an answer to the question that Weinstock raises. I suggest that we publish a shortened letter (see enclosed edited version) along with an answer from Ferguson." (The parenthetical words were part of my review.)
4. To my disappointment, the response from Ferguson and his coauthors was based completely on equations, with no explanation of what was going on. I wanted a physical explanation, not a mathematical one. So I recommended that we ask Ferguson & Co. for something very simple. Of course, as good science writers and teachers know, an explanation that is simple and without equations is sometimes much more difficult to produce. Sometimes when scientists don't have a Feynman-style intuitive understanding of a particular issue, they take refuge in equations. That is, sometimes authors don't understand the physics of every item that they report in their articles. I have encountered this countless times over the years while questioning authors so that I could clarify something in their articles. Sometimes they say: I don't know, my coauthor wrote that part of the article. Or they say: I don't know, I got that from So and So's paper in such and such journal. So in my review of Ferguson's letter I warned that this was one possible reason why we got only equations. I figured that if we were aware of this possibility, then we wouldn't go back to the authors again and again in a futile effort to get something that they were not prepared to supply. Here, in its entirety, is my review of Ferguson's letter: "Weinstock's question should get a physical explanation as an answer, not a



mathematical one like this. I say drop the mathematical one, don't just add the physical one to it. Perhaps ask Ferguson & Co. to write what they would say to a high-school student (or radio audience) who noticed this seeming contradiction. One possible reason that Fergie & Co. answered as they did is that they don't really understand the physics."

5. Benka rejected my suggestion that we ask Ferguson for a simple answer, and, ironically, punished me seven months later for not being fully confident that Ferguson could have provided such an answer. Because my advice was rejected, Physics Today readers ended up seeing no question from Weinstock and no answer from Ferguson.

You can see clearly now that while my performance review says, "he showed questionable judgement in his assessment of the physics competence of the authors," I in fact never made any assessment of the physics competence of the authors, positive or negative. Even if I had made such an assessment, the Physics Today managers did not and cannot accurately claim that the advice it led me to give was anything less than excellent. Their relentless search to find fault with my work, and their twisted and biased evaluations of my work when it contains no real fault, raise serious questions about their professionalism as managers and certainly disqualify them from judging my performance. If you judge that I did good work on the letter, as I claim, then I ask that my performance review mention that work as an example of my routine interest in serving the magazine's readers, and that the numerical rating on my review be raised to reflect the new, unbiased assessment. I ask AIP to make these adjustments not just to make my performance review more accurate, but more importantly as an urgently needed announcement that AIP will no longer use performance reviews to punish employees who raise troubling workplace issues.

As with every other part of my performance review, Benka refused to make any changes in this part of the review when I pointed out its inaccuracy. I asked him if he had any other examples of my supposedly bad judgment. All he could think of was something from an earlier review period: my suggestion that Physics Today try to get G. Pascal Zachary to write an article about Vannevar Bush. Zachary is a journalist -- one of the best in the country, I think -- as well as a history of science scholar. I had learned that he was writing the first ever biography of Bush, who was the first presidential science advisor and an individual who played a key role in shaping the federal science policy that prevailed for decades after World War II. After I proposed this article at a staff meeting, Physics Today publisher Charles Harris spoke about it with AIP history division postdoc Joel Genuth, a friend of Harris's at the time. I spoke with Genuth, too. Genuth advised against the article,

because Zachary was not a mainstream thinker -- quickly adding that he (Genuth) was "no slouch" and could write the article for Physics Today. At a subsequent staff meeting, I reported positive evaluations of my proposal from more established science historians and argued that our readers could handle Zachary's point of view. But Harris stuck with Genuth's review, and so that was the end of my proposal.

Now, more than a year later, during the discussion of my 1998 annual review, Benka has put a new, totally negative spin on my work on the Zachary proposal. To my surprise, when he mentioned my judgment in the Zachary case, Benka showed no sign of embarrassment, apparently completely unaware that Zachary's book was recently published to widespread praise and attention. The vast majority of books are not reviewed anywhere, but Zachary's Endless Frontier: Vannevar Bush, Engineer of the American Century (The Free Press, 1997) was both widely and positively reviewed by well-respected experts writing in major publications. (Please read the attached reviews.) Apparently, the official Physics Today line now is that Zachary managed to hoodwink major American publications and experts -- but not Physics Today. Again, because my advice was not followed, Physics Today readers missed out on what surely would have been an interesting article. Yet I am the one whose judgment is being questioned -- for reasons that I will explain below.

I ask that my performance review be corrected so that my judgment, and its value to the magazine, is discussed positively rather than negatively. I would like my work on the Zachary proposal to be mentioned as an example of the fact that I offer ideas of merit even though I am not expected to be a major source of article or story ideas. I ask that the numerical rating be raised to reflect the new positive evaluation, and that the rating be above average to reflect the fact that I offer more than the required advice. I request that AIP make this change not just to make my performance review more honest, but more importantly as an implied announcement that AIP will no longer prejudice performance reviews against employees who raise awkward workplace issues.

#### **Additional comments**

In the handbook that is given to all employees, the American Institute of Physics promises that the annual performance review will feature a discussion of "mutual goals." (Employee Handbook, page 18.) Without explanation, this year Benka followed neither the letter nor the spirit of this policy, and didn't even pretend to be interested in what direction I might want to go in my work at AIP. The discussion was unlike anything I have experienced in previous years. He simply announced a big change in my job description -- an increase in my workload by as much as

three months' worth of work per year -- and discussed it as if he were giving orders to a machine. Over the years my job description has changed many times (the most recent change being on 25 August 1997), but never by unilateral management dictate, without discussion and mutual agreement. For reasons that I will explain below, I think this change, and its unilateral imposition in violation of American Institute of Physics policy and usual practice, is punitive.

The written review accurately calls the change "new demands." But it inaccurately implies that other Physics Today staff members are meeting such new demands. My coworkers have experienced no such major increases in their workloads either voluntarily or by management order (except in one or two cases in which individuals have voluntarily renegotiated their job descriptions, job titles and salaries). My coworkers and I work hard and cannot reasonably be expected to take on additional work. Among my coworkers who have not stepped up their workloads are Gloria Lubkin, Barbara Levi, Bert Schwarzschild, Charles Day, Irwin Goodwin, Carol Lucas, Toni Feder, Jean Kumagai and Warren Kornberg.

The 25 August 1997 agreed-upon change in my job description reduced my article editing work to 70% of my time (14 articles per year) so that I could increase my work in other areas, which I have done. Now, just a few months later, AIP is using my performance review to arbitrarily increase my annual article editing load to 18 -- a 28 percent jump. The performance review also changes my job description to add a significant load of clerical work (keyboarding) to my job for the first time in my 17 years at the magazine. Other editors who work better on paper (for example, the book review editor and the copy editor) are not being told to change the way they work or to take on the associated clerical work. This clerical work, which includes keyboarding the dozens of changes made by the copy editor, could take as much as a few days per month, depending upon the article. It would lower the overall efficiency of work at the magazine, because the time spent on clerical work would, of course, reduce the time available to do other work such as article editing and article solicitation; instead of paying \$15/hour for clerical work, AIP would pay \$30/hour. Like many people, I do better work on paper than on a computer screen (and a long-standing back problem precludes long sessions sitting in front of the screen anyway). I ask that support staff be made available once again. Even if management had a valid reason for adding clerical work to my job, that reason cannot be a new one. What is new is that, for reasons discussed below, management has suddenly gotten "on my case" and is taking a hard-line on every issue.

In Benka's pro forma discussion with me about my performance review, he never asked about the direction in

which I would like to go on the job. If I were able to take on additional work, I would like that additional work to be somewhat different from what I am doing now, to provide some variety and to contribute to the magazine in a different way. When I explained this to Benka, he acted uninterested and reasserted his uninspiring, unilaterally developed plan for me, which is to do the same work, only a lot more of it.

### Reprisal and repression

The American Institute of Physics is making a strong effort to prevent Physics Today staff members from pursuing workplace grievances in an organized way. Problems are to be discussed with managers on an individual basis only, we have been told. (Message transmitted to staff through warnings to Graham Collins and in other ways.)

Physics Today staff members have many legitimate concerns. Many believe, for example, that the company fails to provide conditions of employment appropriate for professionals. According to my philosophy, if there is a problem, then everyone who is in a position to address it has a moral obligation to do so. Thus, problems at the magazine are everyone's business -- the business at least of everyone who works there. Even though management doesn't see it that way, I have always tried to do whatever I could to help solve problems that arise, whether or not they affect me directly. You, too, are in a position to do something about the problems at the magazine, and therefore I think you have an obligation to do so, for the sake of both the magazine's staff and the physics community.

During the discussion of my performance review, Physics Today editor Stephen Benka condemned my organizing activities at the magazine and said bluntly that such activity "is not going to be tolerated anymore." He characterized the staff actions in which I have played a leading role as nothing more than "disruptive," rejecting my view that the source of the problem is management's failure to address staff grievances. A workplace in which unity is discouraged, as it is now at the magazine, is disruptive. The low morale, the inability to confront problems, the loss of talented and dedicated staff due to a love-it-or-leave-it atmosphere -- these consequences of management policy are disruptive and wasteful.

Physics Today publisher Charles Harris has made it clear to me and to many staff members (names withheld) that our activities have infuriated him. And American Institute of Physics Executive Director/CEO Marc Brodsky has characterized some of my activities, presumably reported to him by Harris, as "counterproductive" (20 March 1998). It is clear that Benka's hard-line attitude toward me is an attempt to redress Harris's and Brodsky's grievances with

the staff -- in particular, with those staff members whom Harris has identified as ringleaders. (Harris's ringleader theory insults the staff, because it implies that staff grievances arise not because of real problems in the workplace, but because an evil few have corrupted the minds of happy but gullible staff members and led them astray like children.)

In this memo I will be open about my organizing activities at Physics Today, because the problems at the magazine call for an organized response and because the physics community strongly supports physicists' right to organize without fear of reprisal. The latter point is evidenced, for example, in the community's many years of support for Soviet physicists who were punished for organizing, and in its concern today for physicists in other countries who face similar repression. In any case, freedom to address workplace problems is a necessary component of a truly democratic society.

Management is attempting in two ways to prevent the Physics Today staff from pursuing collective grievances -- by punishing those who speak out the most and by maintaining an increasingly repressive workplace atmosphere. My lower performance rating and subjection to an arbitrarily revised job description that makes "new demands" are punishments for taking up staff grievances. What follows is a discussion of a few of the collective staff activities in which I played a leading role and for which management criticizes me. Included is a discussion of some of the repressive measures that management has taken in response to those activities. The discussion should make it clear that my review is only one part of a series of recent attempts to stop me from promoting or engaging in any concerted staff activity.

#### **1996 retreat**

During the discussion of my performance review, Benka criticized me for my activities around the 19-20 November 1996 Physics Today retreat. Before that two-day meeting, I and some coworkers (names withheld) developed and distributed to the entire staff a list of changes that we wanted made at the workplace. We presented these requests in the form of a proposed agenda for the retreat. Fearing reprisals for making requests that might not please management, we did not disclose our names. However, the fact that I played a leading role was known to all. Job security was our highest priority, and so our demand for that topped our list. (See item 1 in attached document of 15 November 1996.) Other requests included staff involvement in workplace dispute resolution (item 4), better distribution of job tasks (item 5), affirmative action in hiring (item 8), and conditions of employment appropriate for professionals (the other items).

## Salary equity

I worked with other staff members to demand pay equity at Physics Today. On behalf of those of us who were pushing for this, I told the Physics Today advisory committee at their 4 October 1996 meeting that the large salary differentials among the staff were not only unfair, but also divisive and bad for morale and productivity. I raised the issue at various staff meetings as well. Management was not pleased by the pressure we applied, in part because it forced them to give a staff member (name withheld) a special 25% salary increase, beginning on 1 June 1997.

## Affirmative action

Management's anger at me increased dramatically, and never subsided, when I worked with Jean Kumagai and other staff members (names withheld) to assert the need for equal opportunity and affirmative action in hiring at Physics Today. We raised the issue when Ray Ladbury left the magazine, creating an opening on the editorial staff. (His replacement, Charles Day, started work on 2 June 1997.) I spoke out strongly on the equal opportunity and affirmative action issue, because Jean and I and the others didn't think Physics Today or AIP management took it seriously. Our concerns were largely ignored, and so, later in the year, we decided to bring the problem to the attention of the Physics Today advisory committee at its annual meeting, held 17 October 1997. On behalf of the concerned staff members (names withheld), I brought the matter to the committee's attention.

One week later, on 24 October 1997, American Institute of Physics Executive Director/CEO Marc Brodsky called me and said that I had made "a very, very serious charge." (Detailed notes available.) He directed me to meet with him and defend my charge, and I did so on 5 November 1997. At that meeting I gave Brodsky a note summarizing the important points. Rather than repeat those points here, I am attaching a copy of the note. (See note of 5 November 1997.) That note is an important part of this appeal about my performance review, and so I ask that you read it.

At my meeting with Brodsky I also pointed out that AIP had failed to conduct the affirmative action training that it promised to conduct in its 284-page "1996 Affirmative Action Program for American Institute of Physics." (See attached excerpts.) Among the many promises that AIP makes in that 1996 document is that "During the current plan year we will be conducting training for all employees about our affirmative action program and equal employment opportunity in the workplace." I pointed out to Brodsky that AIP did not conduct the promised training. He countered by saying that he was pretty sure that he mentioned affirmative action either at the one-hour question-and-answer session that he

held on 20 June 1996 or at the Q&A meeting that he conducted for employees at AIP's facility in Woodbury, New York. (I recall no such mention at the 20 June 1996 College Park meeting.) He indicated that this mention was the promised affirmative action "training."

Brodsky said he would look into affirmative action at Physics Today and tell me what he found. After a 4.5-month investigation, he met with me on 20 March 1998 and reported that he found that Physics Today's affirmative action program was doing very well. He said he judges the program by its results. (This was mysterious, because as of 20 March 1998, the Physics Today staff in the College Park office was all white; out of a staff of 18, the magazine had only one minority employee, working from New York.) I asked again about the promised affirmative action training. This time he said he was sure that he had mentioned affirmative action at both 1996 Q&A meetings, and he again indicated that such mention was the promised affirmative action training. After extensive questioning, he said that such mention was "part of" the promised training. I asked him when the rest of the training would be done, and he promised to look into that. In the end, I told Brodsky that we still believe our concerns to be well founded and that we are disappointed with his response. Apparently in Brodsky's view, however, the upshot of what happened is that I leveled serious, totally unfounded charges at AIP, and he is not happy about that.

### 1997 retreat

Management's anger at me increased yet again (and has not decreased since) when I helped raise staff concerns before and during the 25 September 1997 one-day Physics Today retreat. Before that meeting, I played a leading role in producing a list of proposed agenda items that represented a few of the many staff concerns. A majority of the staff supported it, and half of the staff signed it. (See attached e-mail message of 18 September 1997.) The top item on that list was a request for greater staff participation in decision making. The days leading up to the meeting saw much debate between management and many staff members over the meeting agenda, which management was formulating. Harris became upset that the staff wasn't embracing his agenda, and he began treating me and my coworker Graham Collins as ringleaders on the staff side, apparently becoming permanently angry at us.

At the retreat itself I asked if staff members could ask questions. Harris said no. I then said that I thought that we should be allowed to ask questions. Harris angrily said "No, That's an order!" Some days after the meeting he explained that he thought my request for the right to ask questions was another attempt to promote the staff agenda. At the retreat and in subsequent weeks, a number of brave

coworkers openly criticized Harris for the way in which he shut me up.

### **Gag order**

After the retreat Harris put a gag order on me, handing me a written "notice" that implied that I would be fired the next time I said anything that Harris considered to be "counterproductive." (Document dated 26 September 1997 withheld.) This outraged many of my coworkers, who saw my forced silence as against their interest. They openly criticized the gag order, forcing Harris to rescind it. (Electronic mail message of 2 December 1997 withheld.) He did so reluctantly and without any decrease in his anger toward me.

### **Appeal to advisory committee**

The gag order was just one of many management actions that strongly discouraged staff members from raising grievances of any sort. In an effort to get this chill lifted, a number of staff members (names withheld) decided to appeal to the Physics Today advisory committee at its annual meeting on 17 October 1997. We made our appeal to the committee, which reports to AIP's top management, in writing (memo of 17 October 1997 withheld) and in individual oral presentations. Our written note was titled, "Freer Atmosphere Needed at Physics Today" and began, "At Physics Today there is an increasingly repressive atmosphere that discourages staff initiatives...." The memo described how Physics Today staff member Graham Collins had also been warned about speaking up about workplace problems. It contained the following paragraph: "Both Jeff and Graham have been outspoken about problems that many of us see at the magazine. We feel that the lecture to Graham and the written notice to Jeff both contribute to a repressive atmosphere at the magazine and restrict all of us. We hope the advisory committee will do whatever it can to get these warnings retracted, and to remind the PT managers that repression is counterproductive. Such steps would go a long way toward diminishing the fear that staff members now associate with trying to openly address problems at the magazine."

Harris has harshly criticized me for my leading role in the presentations to the advisory committee, telling me and others (names withheld) incorrectly that I tried to get him fired. He sees this as an unforgivable offense that obligates him as a matter of manly honor to fire me or eventually drive me out and that gives him the moral right to do so by any means. Those means include steps that appear honest to outsiders but are not -- such as the present performance review, which imposes an unattainable goal that can be used against me a year from now when it has



not been met. When I explained to Harris that neither I nor the other staff members involved tried to get him fired or even wanted that to happen, he replied that I was either naive or lying. (I still do not want him fired, but I can no longer speak for others on this point. Respect and support for Harris by other staff members, including some not involved in our collective activities, have deteriorated sharply.)

### **Ban on my private conversations**

In pursuit of his agenda, Harris has evidently given Benka license to go after me and other perceived management enemies on the staff. I will briefly describe here a recent example. (A more detailed account is available.) At about 6 pm on Wednesday 28 January 1998, I was in my office talking to my coworker Toni Feder on the telephone when Benka opened the door and asked rudely and sarcastically if I was talking to one of our authors. I said, "No, I'm talking to a coworker, Toni." He acted as if he already knew that. He stepped further into my office and said that he wanted in on our conversation. This was unprecedented and frightful. I switched Toni to the speakerphone and told her that Stephen Benka was here and wanted to be in on our conversation. She sounded equally shocked. Benka suggested that she walk over from her office to mine, and she said OK. I then walked out of my office and into the open area of desks just outside, and Benka followed. I did this to make room for Toni and to get some physical distance between myself and my supervisor, who was clearly behaving very strangely.

After Toni arrived, Benka asked us what we had been talking about on the telephone. I thought his question was way out of line, but I answered it anyway: We had been discussing the May 1998 50th anniversary issue of Physics Today. But after giving that short answer, I said that the important question is why he was trying to barge in on our conversation.

He answered by announcing that Physics Today management is forbidding all private conversations between staff members at work. From now on, all conversations between staff members must be open to management supervision, he said. When I asked him why, he referred to the organizing activity that took place last year and said that he doesn't want that to happen again. This smelled like a retaliatory and repressive policy aimed primarily at me, and so I asked him whether or not it applies to everyone. He said it does. I didn't believe him (but I didn't say that I didn't believe him), and so I pressed him three or four times to say whether or not he was going to announce the new policy to the rest of the staff. His final statement was that he knows that I want to know that.

The policy was never formally imposed on the rest of the staff, of course. But news of management's anger at private conversations spread quickly throughout the staff (yes, by way of private conversations). Even though the totalitarian policy officially applies only to me and Toni, it has put a chill on everyone's expression and has contributed to the repressive atmosphere at Physics Today.

### **Physics Today loses Graham Collins**

In this memo I have for obvious reasons focused on my own case. But I don't want to leave the impression that management is critical only of me. In fact, they target any employee who speaks out about workplace problems. My most outspoken coworker, Graham Collins, was also the subject of a gag order and other reprimands for saying what many on the staff were thinking but were afraid to say. (Graham's gag order and mine were lifted at the same time.) I won't explain here how management irresponsibly made leaving the magazine Graham's best option. The details are available elsewhere. But with permission from Graham and all involved, I am attaching a copy of a note to Graham that I helped write after he submitted his resignation. (See attached note of 16 March 1998; authors' names withheld.) Please read the note as an integral part of my performance review appeal, as it contains a number of important and relevant points not made elsewhere.

### **'On my case'**

As I mentioned above, management is now "on my case," and so my work is now subjected to greater scrutiny. Without precedent, the magazine's management recently examined and criticized some of my work before I completed it. (That was my work on the first of the five decade sections for the May 1998 50th anniversary issue of Physics Today.) Ever since the 1997 retreat, Physics Today publisher Charles Harris has given me the impression that I am being monitored. After the retreat he attended almost every magazine department meeting that I attended -- meetings that he had only rarely attended in the past. After some meetings, he commented privately to others about my performance.

### **Your moral responsibility**

Physics Today's new love-it-or-leave-it policy, mentioned in the 16 March 1998 note to Graham, implies that the magazine's problems originate in the staff. Keeping the focus on the staff is not simply a harmless way that management diverts attention from itself, but is extremely costly. In the short time since Graham submitted his resignation, editor Benka's assistant Susan Funk has quit in frustration, and publisher Harris's assistant Carol Lucas has resigned. The loss of experienced staff, the

discouraged state of many of those who remain, the repressive atmosphere's toll on creativity -- in general, the frustration of those who want their job to be more than a simple exchange of time for money -- in these and other ways current policy wastes the resources of the physics community. You have a responsibility to undo the current widespread cynicism at Physics Today by making staff-initiated change possible.

18 August 1997

Steve --

As I have noted in many conversations and memos over the years, I work most efficiently in my job of feature article editing when I have articles at all stages of development. That means, for example, some articles that have just been solicited, some that have been submitted and reviewed, and some that have been revised by the author and are ready to edit.

As you know, our supply of articles in the last category has followed a "feast or famine" pattern -- mostly famine. This has held down my productivity to the point where I cannot afford to take the full 30-day vacation that I recently requested (and that you approved) and still meet my annual article editing goal. So I am thinking about cutting that vacation in half, perhaps, and using the rest of my vacation time at some later date. I won't be able to work out the details until some articles in the last category trickle in and I can draw up a schedule.

As of today, we have received neither of the two manuscripts that I am going to edit for the December issue. I would be working on them now if we had them. The Riordan manuscript, for example, is not expected to arrive until around the time I had planned to go on vacation. And I have no articles that I can edit now for issues following December. I would like to edit two articles for the January issue and two for the February issue, but I will not be able to do that under our usual famine conditions -- I will need to have the manuscripts much earlier than I have been getting them. If today I had four manuscripts ready to edit for those two issues, I could work on all four simultaneously, using my time to greatest advantage. I think you will agree that the magazine should be in a position where such productivity and advance work is routine.

Given the status of the December manuscripts, a 30-day vacation as planned would compromise my ability to edit two articles for that issue. I would like to take a shorter vacation and continue working at home much of the time, as long as that continues to work well. Please let me know if that is OK, and in any case please see how soon I can have four articles that are ready to edit for the January and February issues.



Jeff

August 19, 1997

Jeff,

It is the responsibility of the article editors at Physics Today to produce finished articles starting from any point in a given article's development.

Thus the responsibility of generating "ready to edit" articles is in part yours. For one example, we had agreed that you would obtain Colson's article on free-electron lasers, and have it edited in case we needed it for an emergency fifth article in the October special issue on the electron; otherwise we could drop it into the magazine a month or two later. Fortunately, we don't need it for the special issue; to my knowledge you have yet to acquire the article.

You were my first choice to edit several articles in late stages of development in the recent past, but turned them all down: Fink (March); Cohn (May; I edited that one, while you edited none that month); Jeanloz to edit with Soulen (August); a second article for October (you were reluctant to take Perl); Kasap for November.

As recently as two months ago, when you wanted to take paternity leave (which I OK'ed), you told me you didn't want any additional articles through the end of this year. As noted above, I offered you some anyway and you turned them down. You expressed no interest in articles, so I left you out of my plans for them.

I understand your special circumstances and once again offer you my heartfelt congratulations on the birth of Joshua Rose. If you are now ready once again to accept the responsibilities that go with feature articles, I can supply you with as many as you want. The articles that are currently "ready to edit" have been assigned to others. Nevertheless, I am sure we can reach a mutually acceptable state of affairs.

A handwritten signature in cursive script, appearing to read "Steve". The signature is written in dark ink on a white background.

# PHYSICS TODAY

from Stephen G. Benka

Jeff, As we discussed,  
as of today we are shifting  
your job tasks slightly:

Actual editing goes from a  
weight of 80% to 70%.

Following up on solicited  
articles goes from 15% to 25%.

—Steve  
8/25/97

2 September 1997

Steve --

Thank you for responding to my note of 18 August 1997, in which I ask for more work -- specifically, more feature-article manuscripts that I can edit for publication in the magazine ahead of deadline. I was dismayed to find that instead of welcoming my request, your response focuses on assigning blame for the lack of such manuscripts and goes on to deny that we have any such deficiency.

You base the first part of your response on the fact that Physics Today staff members do follow-up work with the people whom you have invited to write articles for the magazine. You note that these staff members are therefore "in part" responsible for obtaining manuscripts that are ready to edit for publication. All this is true, but our severe shortage of such manuscripts is not due to deficient solicitation follow-up work by the staff as you imply. The article editors on the staff have, in fact, done a good job of following up on solicited articles -- staying in contact with the authors and working with them to produce the articles that you have asked them to write. If you think you could do better than we do, you should share your secret. For whatever it is worth, my experience is that when a conscientious and hardworking staff is blamed for a long-standing problem, the diagnosis is usually incorrect, and an incorrect diagnosis is an impediment to a real solution. (In my own case, according to my job description, solicitation follow-up has been a small part of my job; but I work at it conscientiously, and on my latest annual review you said that I do above-average work in this area.)

No, the problem is not your staff's lack of competence in its follow-up work with authors. The problem is simply that the magazine has solicited far too few articles. This has had unfortunate consequences, not only for the staff (as my note of 18 August 1997 describes for my case), but also for the magazine's subscribers. In the past three years I doubt that we have had even three months in which we have had a backlog of manuscripts ready to edit. Typically, the editor scrapes each issue together in a near-crisis atmosphere, after a desperate search around the office for manuscripts that may have arrived -- or that are said to be "in the mail." The lineup of articles in most issues of Physics Today is thus dictated by forces beyond our control.

Your listing of manuscripts that you say you offered to me begs the question of giving me more manuscripts that I can edit and prepare for publication, because we did not have the manuscripts on your list. In your own words, they were "in late stages of development." I should point out that even manuscripts that you consider ready to edit often are not. And when the shortage of manuscripts forces us to schedule incomplete manuscripts for near-term publication, we often have to pressure authors to work with us under undo

time pressure. This is unfair to both the author and the Physics Today staff, because it deprives them of the opportunity to do their best and therefore most satisfying work. The largest group to suffer, of course, are the readers. I don't know how many of the articles that you listed fell into that category, because I did not work on those articles.

As I said in my memo of 18 August 1997, I think article editing work is done most efficiently when it is done well ahead of the deadline. So in general I seek to work in advance and am reluctant to take on articles that, due to the shortage, will necessarily have to be done at the last minute, often after I have already scheduled work on other articles and often well after any reasonable deadline for submission. Month after month our work should not consist of "rush jobs" for issues that are upon us. I would have taken on the articles in your list if they had been scheduled for later issues -- or, even better, if they had not yet been scheduled for specific issues. But because of our serious lack of manuscripts, it has almost never been possible to work ahead.

In your response you say that I "agreed" to obtain William Colson's article by a particular date. This cannot be true. There is no way that I or any other Physics Today staff member could credibly "agree" that Colson and his coauthors would finish writing their article by a date that you picked arbitrarily. Only Colson and his coauthors -- all volunteers, remember -- could do that, and they did not. We cannot suddenly and unilaterally spring a short deadline on an author. The most we can do is ask our authors if they can meet such a deadline. Over the years you have asked many authors whether or not they could meet particular deadlines that you had in mind, and you have accepted later deadlines when they told you what they could do. Just because you are now talking to a staff member, rather than directly to the author, doesn't mean you can "just say article" and have it appear.

In the final paragraph of your response to my request for manuscripts, you boast: "I can supply you with as many as you want." This is simply not true. In fact, when we spoke after I received your response, you could not supply even one manuscript that I could edit for the January issue, the February issue or any subsequent issue. Of course, we will eventually come up with something to fill the holes in those issues. But, as usual, that is not likely to happen soon enough to allow us to work ahead. I am sure we could continue to pretend that this modus operandi is not a serious problem -- after all, we have managed to get by with it for a number of years. But it takes an unnecessary toll on many people, and so I think we have a moral responsibility to the staff (article editors, editorial assistants, art editor and copy editors), authors and



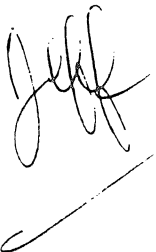
readers to solve the problem. I think the obvious first step is to admit that we do have a serious shortage of manuscripts and that the shortage leads to the problems that I have described here and in my note of 18 August 1997.

As I mentioned above, solicitation follow-up work has been only a small part of my job -- at least that is what I thought. When I saw how much you emphasized it in your response to my note, I took a look at my job description and noticed that such work was a bigger part of my job than I had remembered. Upon further investigation, however, I discovered that you had altered my job description after the fact to add truth to your claim. Indeed, the altered job description was dated 19 August 1997, the same date carried by your response to my note. For future reference, let me say here that I and other members of the staff prefer an above-board management style, where, for example, important changes are pointed out to people rather than being left for them to discover -- or, perhaps, not discover. In any case, you and I discussed the change in my job description on 25 August 1997, and I agreed to it. Thus, I will increase my solicitation follow-up work by about 2/3 and reduce my article editing by 1 part in 8. (I will continue to spend the large majority of my time on article editing.) Because of my preference for doing things above-board, I asked you to write me a note describing the change in my job description, and I thank you for doing so.

For the record: In your response to my note, you say that you OK'd my request for paternity leave. My recollection is that you neither approved it nor denied it, because I withdrew my request before you responded.

So that we don't wander too far from the original issue, let me repeat that I made my 18 August 1997 request because I felt that I was being held responsible for a particular amount of work (my annual article-editing goal) while being made to work so inefficiently that I could not do that amount of work -- at least not with sufficient time left over to take some time off. My revised job description will lessen slightly my need for ready-to-edit articles, and so should provide some relief in this area.

The Riordan manuscript has just arrived, and I would like to work on it now, so as to finish it as far ahead of the deadline as possible. Unless you tell me otherwise, that is what I will do. Perhaps I will take some vacation time later, depending in part on what other work comes in.



**From:** "Martin L. Perl" <martin@SLAC.Stanford.EDU>  
**To:** Jeff Schmidt <jds@aip.org>  
**Date:** 2 Sep 1997 (Tue) 17:13  
**Subject:** Leptons After 100 Years Article

Dear Jeff

Thank you for changing my ugly duckling of a manuscript into a beautiful swan. You have done a wonderful job.

I have the following comments:

Page 35, column 2: the \*\*\*\*\* in "See box 1 on page \*\*\*\*\*" 36 has not been inserted yet.

Page 39, column 2: the \*\*\*\*\* in "See box 2 on page \*\*\*\*\*" 40 has not been inserted yet.

Page 36, bottom equation in column 2: space required between virtual and Z0.

Page 38, Figure 4: TAU DETECTION scheme might be changed to TAU DETECTION apparatus.

Page 40, Box 2, column i: yes, each h should be an h-bar.

Page 40, References: the names in Ref. 3 are spelled correctly; in Ref. 10 the page number is 2074; in Ref 16 the page number is indeed 79c, it is a conference proceedings and every page has a c added to the page number.

Thank you so much Jeff for all your help and guidance. I am greatly looking forward to the issue.

Sincerely yours

Martin Perl

**From:** "George Crabtree" <george\_crabtree@qmgate.anl.gov>  
**To:** "Judy Barker" <jbarker@aip.acp.org>  
**Date:** 15 Apr 1997 (Tue) 19:24  
**Subject:** Vortex Article

**Subject:** Vortex Article  
**Time:** 5:26 PM  
**Date:** 4/15/97

Dear Steve, Jeff, Barbara, and Judy,  
I just received the offprints for our article on Vortex Physics in the April issue of Physics Today. What fast service! The article looked very good in the magazine, and I got a warm feeling on finally seeing it in print. Thanks to all of you for your efficient and competent efforts to bring the article out. For David and me, it is gratifying to see the fruits of our work appear with such high production standards. Thank you all once again.  
Sincerely,  
George Crabtree

George Crabtree - MSD/223  
Argonne National Laboratory  
9700 S. Cass Avenue  
Argonne, IL 60439  
phone: 630-252-5509  
fax: 630-252-7777  
e-mail: crabtree@anl.gov

**CC:** "David Nelson" <nelson@cmt.harvard.edu>

**Letter to the Editor  
Review Form**

MS Number: L-9705-527-U

Author: Weinstock, Robert

Title: Comments on "Probing the Faintest Galaxies, April 1997

Review by: js

Date Assigned: 5/22/97

Date Completed: \_\_\_\_\_

☒ Accept

☐ Reject

☒ Staff Revise

☐ Author Revise

I think a lot of our readers would appreciate an answer to the question that Weinstock raises. I suggest that we publish a shortened letter (see enclosed edited version) along with an answer from Ferguson.

-JS

*Please return to Susan Funk by **5 June 1997**. Many Thanks!*

Review by : \_\_\_\_\_ Date Assigned: \_\_\_\_\_ Date Completed: \_\_\_\_\_

☐ Accept

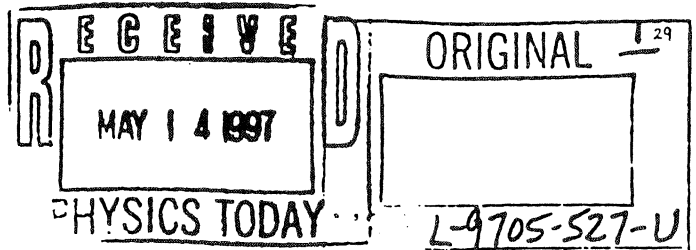
☐ Reject

☐ Staff Revise

☐ Author Revise

OK. Get Ferguson's response.

-Steve 6/30/97



Letter to Physics Today:

In "Probing the Faintest Galaxies", by Ferguson, Williams, and Cowie (April 1997), the caption to Figure 1 reads, in part, "For most of the galaxies in the image, we are looking back more than half the age of the universe".

CS  
This claim seems strange to me; for radiation emitted so long ago must have had its source so close to Earth at the moment of emission — according to the generally assumed big-bang origin of the currently expanding universe — that it would have reached Earth, if at all, well before the era of telescopes, spectrometers, and, of course, us. That this is so springs from the fact that no source can recede from the earth at a speed greater than that of the radiation — namely,  $c$ .

To derive this conclusion, let us measure all times and distances relative to Earth's rest frame and let

$t$  = measure of time, from big bang at  $t = 0$

$T$  = age of universe (= time elapsed from big bang to Earth's receipt of radiation from source)

$\theta$  = time after big bang at which radiation is emitted from source

$\bar{v}$  = average speed of separation of source and Earth from big bang ( $t = 0$ ) to emission of radiation ( $t = \theta$ ).

Thus the total separation of source and Earth at time of emission — i.e., the distance the radiation travels at speed  $c$  from source to Earth — must be  $\bar{v}\theta$ , and the time elapsed during the radiation's journey is

$$T - \theta = \frac{\bar{v}\theta}{c},$$

from which follows

$$\theta = \frac{T}{1 + (\bar{v}/c)}.$$

And from  $0 < (\bar{v}/c) < 1$ , — i.e., the limiting feature of the speed of light — we conclude

$$0.5T < \theta < T.$$

10¢ — Any radiation we receive today must have been emitted, therefore, at least half the age of the universe after the big bang.

How, then, if the above analysis is sound, do Ferguson, Williams, and Cowie — along with others — suppose radiation to have reached Earth in the 20th century from a source that was, at moment of emission, farther from Earth than  $(cT/2)$ ? Since they evidently infer emitter distance from the doppler-shift magnitude, a ready-to-mind answer is their use of an erroneous relation between emitter distance and doppler shift measurement.

If, however, there is something wrong with my analysis above, I shall be grateful to have it explained to me.

*Robert Weinstock*

Robert Weinstock

Emeritus Professor of Physics

Oberlin College

Oberlin, OH 44074

ZWEINSTOCK@OBERLIN.EDU

(216) 775-8337

31

Jeff: Spurred by your review, we are planning to publish Weinstock's letter [①]; Ferguson [②] suggests we read his response [③] and consider publishing neither. What think you?

From: Harry Ferguson <ferguson@stsci.edu>  
To: ACP.AIP(pelliot)  
Date: 7/28/97 10:37am  
Subject: Reply to Weinstock letter

Paul  
28 July 97

Dear Paul,

Here is our reply to the letter to the editor. Actually, we wouldn't recommend publishing either the letter or our reply, as this sort of basic question about light travel times seems a bit out of place for your letters section. Perhaps you should forward our reply to Dr. Weinstock directly and see if that satisfies him? ②

Sincerely,  
Harry Ferguson

SB: Weinstock letter below, followed by Ferguson reply. Ferguson recommends we not publish either. So does Chas. Jeff says otherwise - see next page. I suggest we ask

① Weinstock Letter to the Editor

In \*Probing the Faintest Galaxies,\* by Henry Ferguson, Robert Williams and Lennox Cowie (PHYSICS TODAY, April, page 24), the figure 1 caption reads, in part, \*For most of the galaxies in the image, we are looking back more than half the age of the universe.\*

This claim seems strange to me. Radiation emitted so long ago must have had its source so close to Earth at the moment of emission\*according to the generally assumed Big Bang origin of the currently expanding universe\*that it would have reached Earth, if at all, well before the era of telescopes, spectrometers and, of course, us. That this is so springs from the fact that no source can recede from the earth at a speed greater than that of the radiation\*namely, c. A simple calculation, in fact, shows that we are looking back through less than half the age of the universe. Can it be that Ferguson et al. are using an erroneous relation between emitter distance and doppler-shift measurement?

If there is something wrong with my analysis, I shall be grateful to have it explained to me.

> @SIGNATURE = ROBERT WEINSTOCK  
> @ADDRESS = (zweinstock@oberlin.edu)  
> @ADDRESS = Oberlin College  
> @ADDRESS = Oberlin, Ohio  
>

> Ferguson et al. reply

③ The redshift distribution of the galaxies in the HDF is not known precisely, however, a very conservative guess based on Keck spectroscopy of the brighter galaxies and the colors of the fainter galaxies is that more than half the galaxies have redshifts  $z > 0.8$ .

The statement made in the caption of figure 1 comes from a

ask Weinstock if the answer suffices for him; he may feel publication exposes his lack of understanding of cosmology. What say? You? Paul  
8/13/97

calculation of lookback time to a galaxy at  $z = 0.8$ . For a critical-density universe with a cosmological constant  $\lambda = 0$ , the lookback time is

$$\tau = \frac{2}{3} H_0^{-1} (1 - 1/(1+z)^{3/2})$$

and the present age of the universe is

$$t_0 = \frac{2}{3} H_0^{-1}$$

where  $H_0$  is the Hubble constant.

For this cosmology, a galaxy at  $z = 0.8$  has  $\tau = 0.6 * t_0$ . In other words the lookback time is more than half the present age of the universe.

A general expression for the lookback time with arbitrary values of the cosmological constant and density parameter is given in Carroll et al., 1992, Ann. Rev. Astron. Astrophys., 30, 499 (equation 16).

Henry Ferguson  
Robert Williams  
Lennox Cowie

Paul —

Weinstock's question should get a physical explanation as an answer, not a mathematical one like this. — say drop the mathematical one, don't just add the physical one to it. Perhaps ask Ferguson & Co. to write what they would say to a high-school student <sup>(or radio audience)</sup> who noticed this seeming contradiction. One possible reason that Fergie & Co. answered as they did is that they don't really understand the physics.

— Jeff

28 Jul 97



PHYSICS TODAY

from Stephen G. Benka

Paul,

Forward Ferguson's  
response to Weinstein.  
We won't publish  
either the letter or the  
response.

Steve 8/14/97

# Scientocracy

*Vannevar Bush envisioned a brave new world run by scientists.*

## ENDLESS FRONTIER

Vannevar Bush,  
Engineer of the American Century.  
By G. Pascal Zachary.  
Illustrated. 518 pp. New York:  
The Free Press. \$32.50.

By Thomas P. Hughes

**D**URING World War II, Vannevar Bush mobilized America's engineers and scientists, presided over the making of the atomic bombs, advised President Truman on the decision to use them against Japan and, in a memorable essay entitled "Science — The Endless Frontier," formulated a bold policy for the country's postwar cultivation of science and engineering. He defined, as well, the military-industrial-university complex and gave it the impetus that propels it today. As G. Pascal Zachary observes in "Endless Frontier," no wartime figure in the world marshaled such enormous engineering and scientific resources.

Born in 1890 in Everett, Mass., Bush cultivated his scientific interests while a mathematics student at Tufts and a graduate student in electrical engineering at M.I.T. In the 1920's, when American engineering was in transition from the improvisatory pragmatism of the past to the science-based approach of the future, Bush became known for blending traditional scientific values with the emerging professional ones. At ease in the machine shop as well as in the laboratory, he spoke of himself as using both the hand and the head.

M.I.T., which was in the vanguard of this professional transition, adopted Bush as an exemplary faculty member and later named him dean. He won worldwide peer recognition as the foremost designer of electromechanical analog computers. Decades later, his Atlantic Monthly article "As We May Think" spread the notion of mechanizing the storage and retrieval of information, an idea that fired the vision of several computer pioneers. Zachary, a business and technology reporter for The Wall Street Journal, has aptly subtitled his biography "Engineer of the American Century."

Bush assumed that men of brains, judgment and good will would rise to positions of responsibility in the engineering and scientific world. (He was not at all sure that this was true in political and military realms.) An elitist holding high academic standards, he believed that university engineers should reach out to render public service, not only solving problems assigned to them, but helping to formulate policy as well. This agenda would bring him into sharp conflict with the Washington establishment.

After World War II began in Europe, Bush, answering a call from Washington to mobilize engineers and scientists for national defense, put together the Office of Scientific Research and Development. Contemporaries called it the greatest research and development organization in history. Its story has often been told, but Zachary goes deeper to explore Bush's influential and often controversial views on the role of experts in a democracy, an issue that surfaced then and that remains only slightly below the surface now.

Bush and elitist science associates like James

Conant, the president of Harvard, sharply criticized the military for not developing strategy and tactics that incorporated new weapons, such as radar and the proximity fuze. Bristling with impatience, Bush used his direct access to Franklin D. Roosevelt, as well as his freedom from Congressional oversight and his huge budget, to bring pressure on generals and admirals to accept scientists and engineers as partners in making policy.

Turf battles were inevitable. The Chief of Naval Operations, Adm. Ernest J. King, a formidable opponent, accused Bush of "trying to mess into things in connection with the higher strategy which were not his business, and on which he could not have any sound opinions." Other officers scornfully dismissed the civilian experts as men without combat experience.

Bush's advocacy of unfettered scientific expertise brought criticism from the politicians as well. The United States budget director, Harold Smith, declared that Bush "is too much influenced by the assumption that researchers are as temperamental as a bunch of musicians, and consequently we must violate most of the tenets of democracy and good organization to adjust for their lack of emotional balance." "Most of them," he added, "do not know even the first thing about the basic philosophy of democracy."

Undaunted, Bush, according to one colleague, talked "straight to generals and cabinet officers and the President," and made them "take it." After fierce confrontations, he would sometimes withdraw in the evenings to Washington's exclusive Cosmos Club and negotiate with his opponents over a bottle of Scotch. He often prevailed.

Jerome Wiesner, John F. Kennedy's science adviser, thought that the 20th century might not again produce Bush's equal in engineering and science policy. Alfred Loomis, a knowledgeable science patron, investment banker and radar expert, concluded that among the men whose death in the summer of 1940 would have caused the greatest calamity for America, Roosevelt was first and Bush would be second or third.

**B**Y war's end, however, Bush was bone-tired, broken in spirit and bereft of influence. Finding the Truman Administration's science policies suggestive of a chapter from "Alice in Wonderland," he left the Government in 1948. In his last great effort, he tried and failed to establish a National Research Foundation, a peacetime replacement for the research and development office, one that would cultivate fundamental science both for military and civilian uses. He wanted peacetime science unfettered by political controls, but failing to perceive a growing call for public accountability, he aroused overwhelming opposition. James V. Forrestal, the first Defense Secretary, observed that "even with both ears to the ground," Bush did "not hear the rumble of the distant drum."

Deeply informed and insightful, Zachary has thoroughly captured the spirit of Bush and his times. In evaluating the man's legacy, he honors Bush as a role model for his generation's engaged engineers. But Zachary is impatient with Bush for resisting people whom he considered government interventionists, intent upon pursuing science primarily for the ill-fed, poorly educated and underemployed. Zachary is surely right in concluding that Bush's single-minded support of elitist universities and his advocacy of the "free play of free intellects, working on subjects of their own choice" would find little support in Washington today. □

Thomas P. Hughes is a professor of the history of science and technology at the University of Pennsylvania and M.I.T.

The New York Times, 26 October 1997

# Advocate of the Atomic Age

## ENDLESS FRONTIER

**Vannevar Bush, Engineer of the American Century**

By G. Pascal Zachary  
Free Press. 518 pp. \$32.50

**By Gregg Herken**

**A** LL that has been written about the making of the atomic bomb tends to ignore the fact that the Manhattan Project was primarily an engineering effort. Historians have lavished most of their attention upon the more temperamental—and hence colorful—physicists involved. Journalist G. Pas-

*Gregg Herken, a historian at the Smithsonian, is writing a book about physicists Ernest Lawrence, Robert Oppenheimer and Edward Teller.*

cal Zachary's *Endless Frontier*, the first biography of an engineer who was once the doyen of America's scientific establishment, takes a major step toward setting the record straight.

Vannevar Bush was a prototypical Boston Yankee whose father was a Universalist preacher and grandfather a sea cap-

*"Bush's greatest invention was not a thing but an organization—the National Defense Research Committee."*

tain. Bush's flinty persona and wry humor reflected those origins. (His "screwball" first name was borrowed from that of a family friend.) Educated at Tufts and MIT, Bush received a PhD in electrical engineering in 1916 and set about to broaden his horizons: "I resolved to learn about

men as well as things."

An inveterate tinkerer, Bush invented before he was 40 a device to detect submarines, a code-breaking machine, a solar-powered pump, and the "differential analyzer"—an early, mechanical version of the computer. In the mid-1920s, he co-founded Raytheon and was made wealthy by the

subsequent growth of the electronics giant. In 1939, on the eve of World War II, he became president of the Carnegie Institution in Washington, D.C.

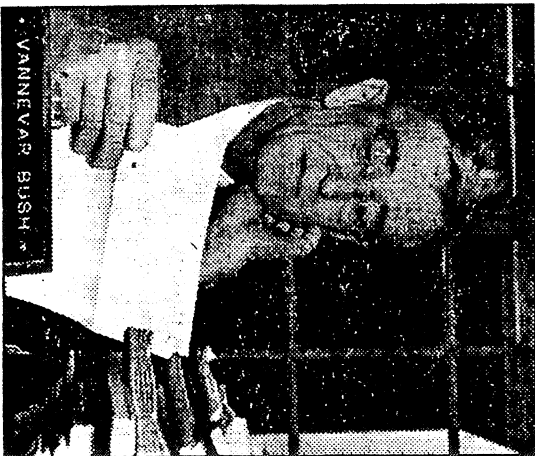
Yet Bush's greatest invention was not a thing but an organization—the National Defense Research Committee—which he

as a threat and the cronies and pols who surrounded FDR's successor, Harry Truman, also feared—with some reason—that Bush's real goal was a technocracy, a government by experts. Blocked at every turn, Bush could do little but complain and wax nostalgic about the halcyon days of the war. He finally left the government in 1948.

Over time, Bush's hardheaded pragmatism became an ossified suspicion of the new. He was most famously wrong about ballistic missiles—"I think these things will be just too expensive and inaccurate to use, even if they could be built"—but his attachment to the analog technology of his differential analyzer likewise blinded him to the potential of digital computers, even though he was one of the first to herald the coming of the information age. (In one area, Bush's naysaying may only have been premature. He warned in 1960 that putting people in space was merely a "stunt" that would eventually "bore the public" and "kill some promising youngsters in the process.")

In retirement, Bush was saved from becoming simply a curmudgeon by two courageous acts that received little or no public attention. In 1952, while on a blue-ribbon panel studying disarmament, Bush tried to postpone the explosion of America's hydrogen bomb until the possibility of a ban on such tests could be explored by Truman's successor. Two years later, Bush spoke out in Robert Oppenheimer's defense at the latter's security hearing, where the physicist was being pilloried for his opposition to the H-bomb. While for naught, Bush's heroic stand at the Oppenheimer hearing was arguably his finest hour.

In an era when science as well as history is said to be only a reflection of changing cultural values, Zachary's book gives a glimpse into a simpler time. Vannevar Bush was the exemplar of a generation that has now vanished. Bush evoked the attitudes and standards of that generation when he wrote, in December 1940, of standing "at the mouth of the cave with a few strong men of the clan armed with stone axes against a hostile world."



Vannevar Bush in 1947

ASSOCIATED PRESS

dent of Harvard—whom he described as a "square-shooting, levelheaded liberal." The pairing of Bush and Conant created one of the most remarkable intellectual partnerships in the modern history of science and technology, but it receives disappointingly little treatment in this otherwise excellent book. (Readers are advised to consult Jim Hershberg's brilliant biography of Conant, which can be read as almost a companion volume.) When World War II finally arrived, Bush created a large, umbrella organization—the Office of Scientific Research and Development—and assigned the NDRC to Conant. Together, the duo not only oversaw development of the decisive weapons of victory—radar, the proximity fuse, and the bomb—but also became Roosevelt's de facto science advisers.

"Science—The Endless Frontier" was the 192-page plan for postwar federal support of scientific research that Bush prepared for Roosevelt as victory approached; he intended it as his legacy. Like the NDRC and OSRD, Bush wanted peacetime

The Washington Post

and President Franklin Roosevelt created in time to mobilize the country's scientific brainpower for the coming conflict. The quality that Bush typified and that he valued most—the ability "to think straight in the midst of complexity"—was key to his and the NDRC's success in jump-starting the nascent atomic bomb project, which hidebound bureaucrats and flighty physicists had let dead in the water. When a National Academy of Sciences panel dithered as to whether a bomb was possible, Bush added a handful of engineers and sent them back to the drawing board; the panel decided the bomb was feasible after all.

Bush also had the talent to recognize his own limitations. "Most of this was over my head," he readily admitted to physicist colleagues who were probing the mysteries of fission. Accordingly, Bush teamed up with another Bostonian—chemist James Conant, presi- —Continued on page 5

## Arms and the Man

By ERICH EICHMAN

It is odd to think that a man whose face appeared on the cover of Time magazine in 1944, and whose death occasioned a front-page obituary in the New York Times 30 years later, should be all but forgotten today. But such is the fleeting fame of the



### Bookshelf

*"Endless Frontier"*  
By G. Pascal Zachary

technocrat. Vannevar Bush was much more than that, of course. He was a pioneering engineer and inventor, an entrepreneur, a visionary and a social philosopher whose "Modern Arms and Free Men" was a 1949 bestseller and whose hymn to science (and appeal for funding), "Science—The Endless Frontier," caused a sensation when it was released in July 1945.

But his glory years were spent in Washington heading up various technocratic entities (the Carnegie Institution, the Office of Scientific Research and Development), advising presidents, pulling strings on Capitol Hill, worrying over funding, and overseeing projects, most notably the secret one that produced the first atomic bomb.

In his way, Bush was a precursor of the "Wise Men," the elite insiders who guided U.S. policy in the postwar years. His influence reached its height under Roosevelt and faded precipitously thereafter, but his concerns—the relation of science to government and the military, its role in society—are still very much with us.

No doubt Bush would have welcomed our computer revolution, for he was essentially an optimist who saw technology as a force for good. Most important, during the crisis years of his greatest prestige and authority—when the country was at war or preparing for it—he argued (presciently, convincingly) that science had something essential to contribute to national defense, especially if civilian researchers were allowed to do their work unmolested by military bureaucracy.

Journal reporter G. Pascal Zachary has brought this able, conscientious, energetic and wrongly forgotten man to life in "Endless Frontier: Vannevar Bush, Engineer of the American Century" (Free Press, 518 pages, \$32.50). A few excerpts:

*In the 1930s:* "While innovation was clearly becoming corporatized, Bush still believed that the 'lone researcher often does produce out of thin air a striking new device or combination which is useful and which might be lost were it not for his keenness.' Bush was himself just such an irrepressible inventor. While an astute manager of research teams, he often pursued his grandest intuitions alone. Rapid retrieval of personalized data, stereopho-

tography, typography, internal combustion engines and perpetual motion were just a few of his obsessions. For him, inventing was a calling, a way of life."

*At the commanding heights:* "Intensely self-assured, [Bush] deferred to no one, save Roosevelt and his mentor, Henry Stimson, the secretary of war. In the heat of war, his penchant for barging ahead worked wonders. The military gave more leeway to him than perhaps any other civilian in the war. Members of Congress granted his every request. 'Never once did we ask for funds and fail to secure them promptly,' Bush later boasted. Legislators rarely even questioned him, and when they did the exigencies of war made it possible for him to duck the tough queries anyway. He never flatly refused to satisfy a politician's curiosity, but rather dared him to comprehend the technical and military issues. Most politicians wisely kept their mouths shut."

*The response to Bush's 1945 report:* "Business Week called Science—The Endless Frontier 'an epoch-making report' that is 'must reading for American business men.' The Washington Post applauded Bush for delivering a 'thorough, careful plan for putting the needed push of the federal government behind our scientific progress.' . . . Only a handful of commentators questioned Bush's basic principle that research deserved broad public funding. The Wall Street Journal, for example, argued that tax incentives could achieve a similar result by inducing private industry to spend sufficiently on research."

*After the war:* "[Bush] shared with other elitists a stark and not altogether distorted view of American society that pitted sober, pragmatic elites against the untutored, volatile masses. For Bush, Truman and his cronies as well as most congressional leaders clearly fell into the 'masses' category. While Truman delighted in casting himself as an ordinary American, Bush—and other elite leaders—tended to view such citizens as irresponsible and sometimes irrational. The elite assumed that the mass of Americans needed patriarchal authority. In Bush's view, civilian technocrats were the solution to the inherent contradiction between the increasingly complicated problems facing government and the nation's democratic traditions. In practice, this meant that the public must pay for experts to make decisions in its name; these experts would brook little or no interference."

*Looking back, in the 1950s:* "He wondered whether men could 'live without war.' Now that 'the glamour of war is gone,' he asked whether the kind of direct combat 'that once had a real appeal for the red-blooded man' was obsolete. Others had noted that modern technology had made war impersonal and that the 'virile attributes' of war, which enlivened societies in the past, would have to arise from another source. But Bush's romantic yearning for an earlier stage of combat seemed peculiar given his role in exploiting the very technologies that further dehumanized war."

# A vivid tale of an American science czar

By David Warsh  
THE BOSTON GLOBE

**R**oosevelt called me into his office and said, 'What's going to happen to science after the war?' I said, 'It's going to fall flat on its face.' He said, 'What are we going to do about it?' And I told him, 'We better do something damn quick.'

Those are the words of Vannevar Bush, longtime professor at the Massachusetts Institute of Technology and America's science czar in World War II. They evoke the Washington manners of 1944, when those in positions of responsibility understood that they trod upon a historic stage and spoke such clipped sentences easily.

Bush had served as Roosevelt's science adviser since June 1940, overseeing the development of radar, the computer, the atomic bomb, antibiotics. When Roosevelt asked for a postwar plan, Bush delivered it in a hurry.

In just four months, he responded with a famous report, "Science—The Endless Frontier," synthesizing the work of a series of blue-ribbon committees. Though much battled over in the corridors of power, it nonetheless became the blueprint for the nexus between government, industry and academia that has lasted to the present day.

More than any other person, it was Bush who designed America's national system of innovation in the post-World War II era: the universities directing basic research, the federal government paying the bills and corporations concentrating on applied research, somewhere in between.

This was a good deal more fundamental than, say, thinking up the interstate highway system or inventing the television network. It could be argued (setting democracy aside) that it was the innovation system more than anything else that won the Cold War.

Bush is now the subject of a wonderful new biography by George Zachary, *Vanishing Act: The Vannevar Bush Enigma*, from the American Century. It takes a look at the man who did what was important in what he

## Commentary

accomplished in the years between 1939, when he went to Washington, and 1954, when he left full-time government service and returned to MIT.

Yet even Bush's failure to adjust after those great days underscores the importance of the forces he had set in motion. And in Zachary's hands, the human forces behind the strange twists of technological developments are always available for inspection.

Named for his father's roommate at Tufts College, Bush went to Tufts himself. Afterward, with his Tufts roommate, Lawrence Marshall, he started a firm to make radio tubes that they called Raytheon. The firm was a success, but Bush went on to teach electrical engineering at MIT, where he pioneered in developing analog computers. Duty called in 1939.

By far the greatest part of Zachary's book concerns the war years. And here the stories are just too numerous to do more than list. The author's day job is as a reporter for *The Wall Street Journal* in San Francisco. He has a journalist's eye for color and knack for narrative; he has a historian's ear for deeper concerns.

So he weaves tales of the Manhattan Project with yarns of Bush's association with the Office of Strategic Services; stories of the FDR cabinet with anecdotes from scoundrel times. (One of his finest moments came when he went to bat for J. Robert Oppenheimer, whom he saw as a victim of technological differences of opinion.)

It turns out to have been a far more complicated world than Bush had contemplated. Battles over federal funding of science are recounted. Bush favored winding down the military's role in funding science at the conclusion of the war; President Harry Truman overrode him in 1945. When the National Science Foundation finally was created five years later, Bush disclaimed the agency he had imagined. He feared that it was too little, too late.

After leaving government, Bush seemed to shrink in stature. The man who had marshaled forces on a equal footing

By the 1970s, U.S. industry found itself in a paradoxical situation: 'Awash in theoretical knowledge, it was starved for the basic processes and products that lead to victories in commercial contests,' according to a new biography of Vannevar Bush.

with Eisenhower, George Marshall and Chester Nimitz suddenly was a voice that found its fullest expression against the new: against guided missiles and satellites, against the race to the moon, against consumerism. He served to good effect on corporate boards, with the pharmaceutical company Merck in particular. His son founded Millipore Filter Co.; his younger son raised turkeys in New Hampshire.

The world was far more bottom-up than the top-down world he favored, and, according to Zachary, this had deleterious effects on America's competitive position in the world economy. He writes: "The great defect of 'Science—The Endless Frontier' was its neglect of industrial innovation." Science was lionized as the source of all progress; invention and commercial engineering were fobbed off as subsidiary concerns. The result was that by the 1970s, U.S. industry found itself in a paradoxical situation: "Awash in theoretical knowledge, it was starved for the basic processes and products that lead to victories in commercial contests." (Oligopolistic market structure may have had something to do with it, too.)

Nobody knows better than Zachary how it was that, in key industries at least, American businesses fought their way back to positions of global supremacy. His first book, *Showstopper: The Breakneck Race to Create Windows NT and the Next Generation of Microsoft* (now undeservedly out of print), is a remarkable chronicle of the development of a major piece of software.

Its publisher here is Dave Cutler, who was born in 1942, when Bush was at the height of his powers in Washington. Yet by

the end of the book, we understand that Cutler (once a top Digital Equipment executive) in his way has been just as effective in welding together a team hell-bent on a fixed objective as was any of Bush's minions in the war—with no higher authority behind Cutler than Bill Gates, the business strategist who built Microsoft on little more than his understanding of what it meant to be the standard.

Gates commands a research and development effort as extensive as any ever commanded by Bush. And the commercialization of research and development that began when International Business Machines moved into computing and American Telephone & Telegraph developed the transistor (and then stood by while Silicon Valley took its development to the next stage) has gone far beyond what he contemplated.

Which just goes to prove the point. Whatever its deficiencies as a plan of action, the outline first sketched in "Science—The Endless Frontier" have evolved into a pretty good map of the territory. The relationships between the regions are better understood. So are the possibilities for failed communication. The boundaries themselves seem a little more finite; the competition for resources a little more intense.

But veterans of a hundred cowboy movies knew what lay plans next. Some guy comes through with a roll of barbed wire, or a motor car, or a machine gun, and it's off to the races again. The frontier is for ever closing, at least as originally understood. And new vistas are opening all the time.

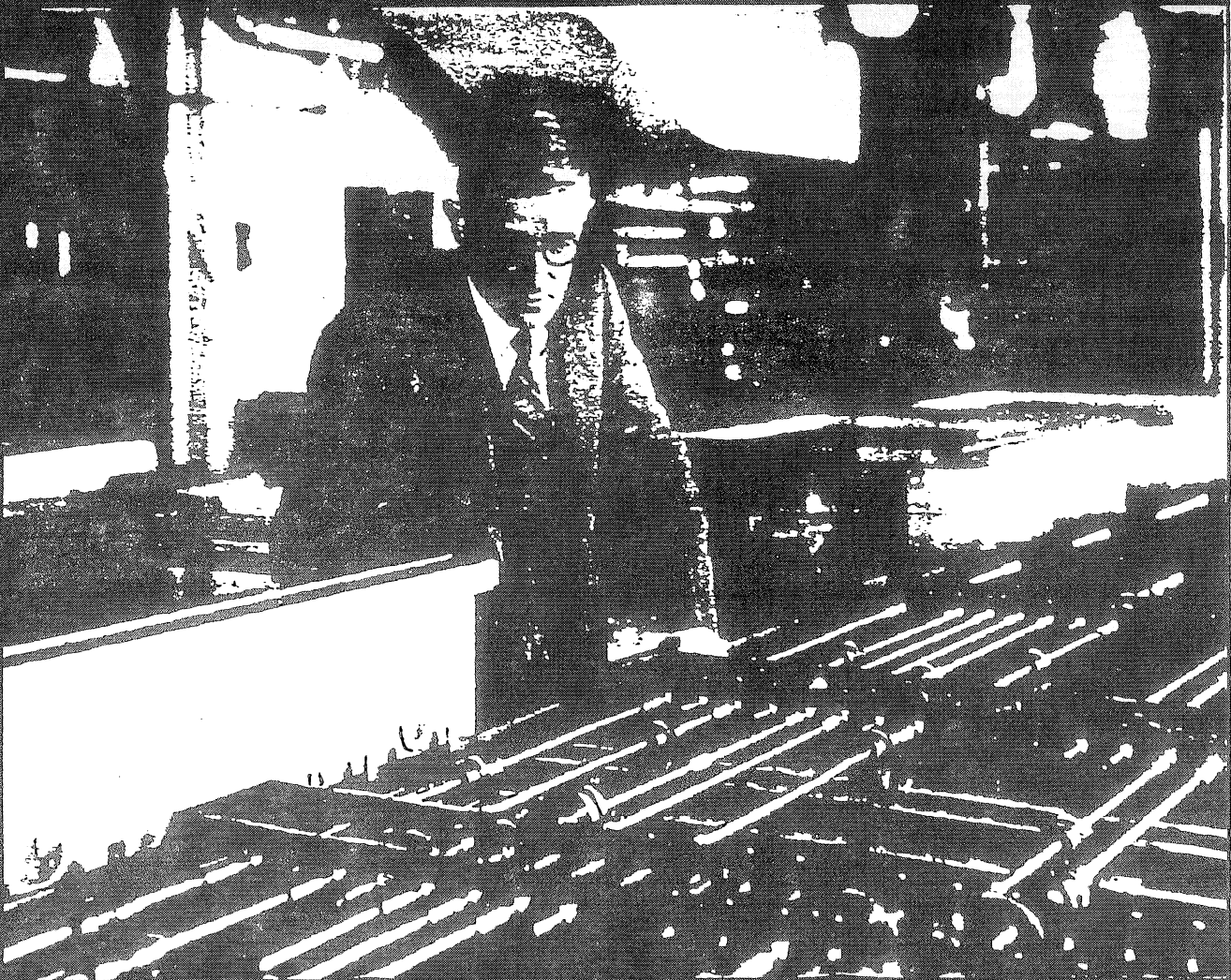


San Jose Mercury News, 31 August 1997

SAN JOSE MERCURY NEWS

# BOOKS

AUG. 31, 1997



VANNEVAR BUSH  
AND THE POLITICS  
OF SCIENCE

## INSIDE

**TAPPED OUT:** Beer industry's love affair with marketing resulted in some flat sales. Page 4

**AUDIO 'AMBUSH':** Tom Wolfe's first fiction in a decade travels the recording route. Page 7

# A well-engineered life

■ Vannevar Bush devised policies that altered our lives

**ENDLESS FRONTIER: Vannevar Bush, Engineer of the American Century**  
By G. Paschal Zachary  
Free Press, 490 pp., \$32.50

BY PAUL PREUSS

**A** CHAMPION of scientific expertise in government, Vannevar Bush's name and face were all over the covers of *Time* and *Fortune* and *Newsweek* in the 1940s, but today — except for the mistaken impression that Bush foresaw the personal computer and the Internet — few remember him. Wall Street Journal reporter G. Paschal Zachary has performed a valuable service with this admirably detailed biography of a man who not only was the 20th century's leading American engineer, but who in a real sense engineered the American century.

How should history judge a man who described many of features of the PC in 1945 and inspired the pioneers of the personal computing movement, but who disparaged digital electronic computation? Bush built an enormous mechanical computer of brass and steel, known as a differential analyzer, as early as 1931. Although he helped found Raytheon in 1924 to manufacture better and cheaper electronic tubes for radios, he never lost his affection for analog computing machines. The memory in Bush's proposed desk-sized "memex" (never built) would have consisted not of magnetic tape or disks but of reels of microfilm.

How should we assess the vision of someone who headed NASA's predecessor organization, the National Advisory Committee for Aeronautics (one of his first acts was to establish a research center in Sunnyvale), but who thought rocketry was a waste of time and did his best to discourage the development of satellites, intercontinental ballistic missiles and moon rockets?

The middle years of the century, the years of World War II when Bush was at his acme, were a fulcrum for our national values, our self-image and our conception of ourselves as a distinctive people in the world. Like his times, Bush was a mass of questions and contradictions. He founded the Office of Scientific Research and Development (OSRD) and fought savage bureaucratic battles with Army and Navy brass to persuade them to invest in weapons



ASSOCIATED PRESS/WIDE WORLD — FROM 'ENDLESS FRONTIER'

Vannevar Bush, shown here in 1942, was a high-profile engineer during World War II.

development: Because of Bush, American radar helped sweep U-boats from the sea, and the proximity fuze made anti-aircraft guns and artillery devastatingly effective.

At first Bush opposed nuclear research, thinking the prospects for a bomb "remote from a practical standpoint." He ended up launching the Army's Manhattan Project. What to think of a man who advised dropping the bomb on Japan, then wanted to share

nuclear secrets with the Soviet Union — and who staunchly opposed the development of the H-bomb?

He sounds almost liberal. Not at all. Bush was so conservative he distrusted democracy. Although he was one of Franklin Delano Roosevelt's greatest admirers and closest advisers, he thought the president should be relieved of his burdens by delegating power to a committee of technical experts. During the Communist witch

hunts after the war, Bush failed to defend the distinguished scientist E.U. Condon, under attack by the House Un-American Activities Committee, noting that "Commie infiltration constitutes a genuine menace in this country."

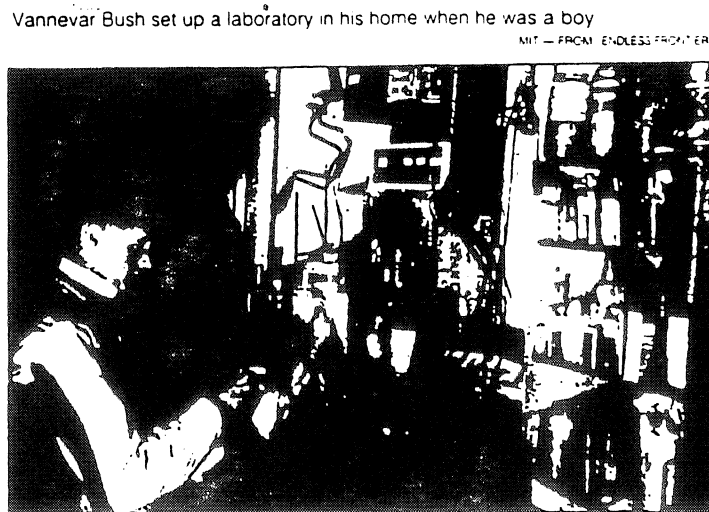
A Red baiter, then? Not that easy: He was one of Robert Oppenheimer's staunchest defenders at the 1954 AEC security hearings and a scathing critic of Joseph McCarthy. In 1967, Bush recalled, "Good Lord, I worked with Hoover, Truman, Eisenhower, Roosevelt, Kennedy, and I don't think any of them ever knew what my political philosophy was or were in any way interested in it."

Born in 1890 in Chelsea, Mass., the son of a Protestant minister, Bush began his inventing career while a student at Tufts College, where he earned a patent on a sort of analog computer mounted on a wheelbarrow, a surveying device. After graduate school at the Massachusetts Institute of Technology, he eventually became a professor there, and by 1932 he was MIT's vice-president. Washington, D.C., proved to be but a short step away.

Bush advocated civilian control over military research, but through the OSRD and other organizations he did more than anyone else to establish the military-industrial complex. After the war, his opposition almost sunk the National Science Foundation and the civilian-controlled Atomic Energy Commission (today's Department of Energy) — and each had been his own branchuk! Bush was a masterful politician who could threaten and cajole and occasionally deceive to get what he wanted, but he had no constituency except scientists and engineers; having lost the support of younger scientists, his power quickly slipped away.

Virtually discarded by government leaders after World War II, Bush kept an office at MIT and died at home in 1974 at the age of 84. "In hindsight, how does one judge Vannevar Bush?" Zachary asks. "Right or wrong? Good or bad? Success or failure? Such questions certainly would strike Bush as absurd. ... His was a life not of looking back, but of charging ahead." Maybe a full reckoning of his importance isn't possible. Bush himself liked to say, "It is earlier than we think." ■

Paul Preuss' new novel is "Secret Passages."



MIT — FROM 'ENDLESS FRONTIER'

## books

## An EE who swayed the world

GRANGER MORGAN

**A**sk most electrical engineers to list who did most to shape the second half of the 20th century, and few are likely to include one of their own: Vannevar Bush, professor of electrical engineering at the Massachusetts Institute of Technology (MIT), co-founder of Raytheon Corp., and civilian director of the massive U.S. R&D effort during World War II. Yet the development of radar, the proximity fuse, effective anti-submarine warfare, and countless other innovations played the decisive role in tipping the balance of the war to the Allies and, in the longer run, in securing democracy as the pre-eminent form of government for industrialized states at the close of this century.

Bush was born in 1890 in a town just north of Boston, where his father was a Universalist minister, and he grew up in a nearby community to which the family moved in 1892. He was a strong-willed young man, with a "spark of belligerency," who from time to time endured bouts of illness. He showed great promise in mathematics and science, and perhaps just as important, proved adept at building things with his hands.

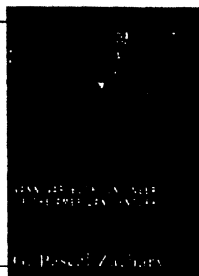
Biographer G. Pascal Zachary, a senior writer for the *Wall Street Journal*, explains that in "tinkering in his basement, Bush shared an activity with many brainy, middle-class boys around the country. The romance of invention... was contagious... [and] Bush realized that the path of the inventor offered him perhaps the only means of achieving conventional success without sacrificing his maverick leanings."

In 1909, when Bush graduated from Chelsea High, he was an independent-minded, politically conservative middle-class New Englander. He was "impatient with pomp," Zachary reports, an "outsider who resented the elite of society but hungered for recognition too." He went to Tufts University, in Boston, where he earned bachelor's and master's degrees in engineering. On one occasion, he read the textbook for a course in advance and asked the professor if he could cut classes to make some time available for other things, and just take the final exam when it occurred. The professor instead gave him the test on the spot—Bush passed and was granted credit.

After working briefly at General Electric Co., Bush entered a doctoral program at Clark University but then transferred to MIT, where he completed a thesis in the new electrical engineering department in less than a year. In 1916 he accepted a job at Tufts and, in parallel, took a position as laboratory director for American Radio and Research Corp. (Amrad). Three years later he moved to the electrical engineering department at MIT, where he expanded his program of research and industry consulting.

Bush's work at Amrad eventually con-

**Endless Frontier: Vannevar Bush, Engineer of the American Century.**  
Zachary, G. Pascal,  
The Free Press, New York,  
1997, 518 pp., \$32.50.



tributed to the establishment of a new company, Raytheon Corp., which grew rapidly, supplying vacuum tubes for the consumer radio market. Bush prospered along with it.

In 1932 Karl Compton, MIT's new president, made Bush vice president and dean of engineering. While the position gave him wide administrative responsibilities and greater exposure on the national scene, it did not end his research activities or consulting. Much of his research at MIT focused on analog mechanical computing machines (termed "differential calculators") and on "rapid selectors" for searching large physical files (such as banks of microfilm).

As the risk of war grew in the late 1930s, Bush became concerned with laying the R&D foundation for a conflict whose outcome, he believed, would be determined by technological prowess. He had already begun to expand his activities in Washington, D.C., when in early 1939 he was named to head the prestigious Carnegie Institution of Washington, a position that provided the springboard that soon vaulted him to the pinnacle of power.

Bush's appointment in 1940 to chair the National Defense Research Committee (NDRC), which was later transformed into the powerful Office of Scientific Research and Development (OSRD), resulted from vision, good ideas advanced

## books

at just the right moment, the right friends, and superb salesmanship combined with technical accomplishment and great administrative skill. Bush built an organization that, while coordinating with the uniformed military services, defined its own research priorities and ran its own show with minimal oversight by the President and Congress.

Bush pioneered new contracting methods that mobilized the nation's top scientists and engineers, with minimal red tape, to address key problems, often in their own laboratories. By 1944 "OSRD was spending \$3 million a week on 6000 researchers at more than 300 industrial and university labs." This count does not include the building of the atomic bomb by the Manhattan Project, over which Bush had responsibility through different administrative arrangements.

Readers unfamiliar with the critical role played by Bush and the OSRD in the war effort will find the central 150 pages of Zachary's biography an exciting and invaluable introduction. Details of Bush's skilful wooing and bullying of military leaders such as Admiral Ernest J. King are particularly interesting. I would have preferred a few more technical details, but except for confusion between the capabilities of the German V1 and V2 weapons, those provided are accurate.

Accustomed to wielding great power with remarkably little accountability, in the post-war era Bush found it difficult to adjust to the reemergence of politics-as-usual and bureaucratic regulation. He strongly supported the atomic bomb he had helped create, but he also recognized that the bomb had changed the world, and worked hard, if without much success, to put in place an international regime to manage this threat to security. On the other hand, he was slow to recognize the great strategic importance of ballistic missiles and the military uses of space. This blind spot worked to erode his standing with post-war military leaders.

Bush is widely credited with being the father of the social contract that guided post-war R&D in the United States. He was the principal author of the report, "Science the Endless Frontier," which today is perhaps the most venerated, if rarely read, icon in Federal science and technology policy circles. Zachary's account makes it clear that while many of the ideas that led to the post-war system of Federal R&D originated with Bush, and with OSRD contracting experience, Bush by no means deserves all the credit. Indeed, his strong will, plus his failure to understand the changing political landscape, did much to delay the creation of the National Science Foundation.

In Zachary's account, Bush is an immensely impressive man to whom the country and the Western world owe a great debt of gratitude. He was also human, with an ego, a strong and sometimes abrasive style, and other failings and limitations. These are recounted with an honesty that in no way detracts from Bush's great achievements as an engineer, as an entrepreneur, and as an excellent R&D administrator.

Most of the "big names" in U.S. science and technology policy have started out in science, especially physics. But this fascinating and well-written biography is a reminder that one of the greatest of them all, and perhaps the most influential, was an electrical engineer.

Granger Morgan is the Lord Chair Professor of Engineering at Carnegie Mellon University, Pittsburgh, where he also is head of the department of engineering and public policy and a member of the faculty in electrical and computer engineering.



15 November 1996

Proposals for discussion at Physics Today retreat

The following proposed agenda items are in the spirit of Steve's invitation to put our concerns "on the table." This list was put together by some of the staff, based on discussions among staff members. The theme of these proposals derives from the main points raised by the Physics Today advisory committee: openness, staff empowerment and editorial efficiency. The proposals address issues that are very important to at least some of the staff, and they are intended to provide a basis for discussion. Each proposal is subject to adoption, modification or rejection during the retreat. PLEASE ADD TO THE LIST.

1. Agreement that we want to keep all the present staff members.
  - Security is a prerequisite for speaking freely, sharing ideas and experimentation.
2. Openness.
  - Recognize that all staff members are legitimately concerned about all aspects of the magazine -- both content and process.
  - Proposed changes in magazine's content or process should be announced to the staff and discussed.
  - Make letters to the editor available to all staff.
3. Volunteer reporters -- a staff-based information system.
  - Reporter gathers and disseminates information on progress toward agreed-upon goals. Not intended to replace management's information system. (Example: reporting on progress toward hiring someone to categorize books.)
4. Problem resolution: Editorial and other.
  - Editorial judgment: Burden of proof on critic.
  - In disputes, staff members are encouraged to consult others on staff.

5. Distribute work according to staff interest.
  - Adjust job descriptions of yet-to-be-hired editorial and secretarial staff members based on current staff interests.
6. Physics Today management should act in a way that leads staff to see them as their advocates rather than as the local representatives of higher management.
  - Advocates in editorial controversies.
  - Advocates in annual reviews.
7. Voluntary staff participation in hiring.
  - Participate in writing job advertisements.
  - Examine resumes.
  - Talk to candidates.
  - Offer recommendations.
8. Take affirmative action to increase diversity of Physics Today staff.
9. Allow staff to solicit outlines for articles.
10. No need for detailed schedules.

(Distribution: All PT staff and managers.)

5 November 1997

Marc,

Thank you for asking me to meet with you today about my statement to the Physics Today advisory committee that the magazine has failed to live up fully to its claim that it is an affirmative-action employer.

I am taking this opportunity to outline the history of the issue at the magazine and to discuss the important difference between equal opportunity and affirmative action.

At a November 1996 Physics Today meeting, some of us on the staff raised the issue of affirmative action and the lack of diversity at the magazine. Several weeks earlier, one of the Physics Today editors had submitted his resignation, thus presenting us with an immediate opportunity to work toward correcting the problem. At the meeting, I said I would help monitor the situation in the future, as did Jean Kumagai, who is the only minority among the 18 individuals who work at Physics Today.

On 14 April 1997 the Physics Today staff learned that out of the 85 applicants for the editorial opening at the magazine, three had been selected to come in for interviews -- all white males. Among the 85 applicants were a number of potentially qualified minorities and women. Jean and I argued that if Physics Today were truly committed to affirmative action, it would also bring in some of these applicants. That could have been done easily, but Charles Harris and Steve Benka refused, saying that it was not worth the delay of a week or so that it would cause. We felt that this revealed Physics Today's priorities (and AIP's, too, because Charles had told us that he had discussed the institute's affirmative action policy with Terri Braun after the November 1996 staff meeting), and that affirmative action clearly was low on the list.

The decisive factor turned out to be that while Charles believes in equal opportunity, he does not believe fully in affirmative action. He told me, for example, that he would not hire a minority who is qualified to do the job unless that individual was more qualified than all 84 of the other candidates. Such a policy can lead to an all-white staff even though many minorities are qualified to do the work. For reasons outside of our immediate control, qualified minorities are less likely to have credentials beyond those needed to do the work. Thus, the qualified minorities are passed over in favor of white applicants who have such superfluous credentials. The result is a staff that doesn't look like the population of people who are qualified to do the work. Thus the Physics Today staff does not look like the physics community, the journalism community, the Washington community or the nation as a whole. As long as Physics Today fails to embrace affirmative action, minorities will continue to be in the subset of applicants

deemed qualified to do the job, but rarely among those actually hired. Thus "equal opportunity" amounts to a de facto "whites only" hiring policy at Physics Today. Historically, affirmative action was instituted to overcome this shortcoming of equal opportunity.

Charles also told me that staff diversity is of no value to the magazine -- except to make the office a more interesting place to work. Therefore the fact that a particular job candidate would contribute to the diversity of the staff counts for nothing, he said.

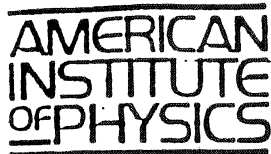
My own concern about affirmative action at Physics Today was heightened when AIP and the magazine relocated from New York City to College Park four years ago. To fill the editorial openings created by the move, the magazine hired three individuals, all white males -- Ray Ladbury, Denis Cioffi and Steve Benka. None of the three had any journalism experience, but the magazine was willing to train them. (One could view this as an affirmative action program for white males.) If the magazine is willing to hire and train potentially qualified whites, then why not do that for minorities, too?

The managers at Physics Today made two token gestures in response to the pressure that we applied: They told a few organizations of minority scientists about the job opening, and, after they filled the position with a white male, they phoned a few of the minorities whom they had judged to be "promising candidates."

Ever since my disagreement with Charles over affirmative action at Physics Today, he has treated me a little bit like an unwelcome troublemaker. You should be able to verify any point that I have made in this note without attributing it; by doing it that way, you can avoid exacerbating this problem.

Jeff





One Physics Ellipse  
College Park, MD 20740-3843

Tel. 301-209-3100  
Fax 301-209-0843

## 1996 AFFIRMATIVE ACTION PROGRAM

FOR

AMERICAN INSTITUTE OF PHYSICS

Program completed by:

A handwritten signature in cursive script, reading "Theresa L. Braun", written over a horizontal line.

Theresa Braun  
Director of Human Resources and  
EEO Coordinator

Address:

One Physics Ellipse  
College Park, MD 20740-3843

Program approved by:

A handwritten signature in cursive script, reading "Marc H. Brodsky", written over a horizontal line.

Marc H. Brodsky  
Executive Director/CEO

This Affirmative Action Program is effective from January 1, 1996 to December 31, 1996.

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**Member Societies:**

The American Physical Society  
Optical Society of America  
Acoustical Society of America  
The Society of Rheology  
American Association of  
Physics Teachers  
American Crystallographic  
Association  
American Astronomical Society  
American Association of  
Physicists in Medicine  
American Vacuum Society  
American Geophysical Union

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## INTER - OFFICE MEMORANDUM

July 11, 1996

TO: Theresa C. Braun  
FROM: Melinda Underwood *mu*  
SUBJECT: Affirmative Action--1995

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Below are the area in which AIP had underutilization in 1995:

Senior Managers	Female and Minority Underutilization
Senior Professionals	Female Underutilization
Other Professionals	Minority Underutilization

Let me know if you want to develop a narrative discussion of goals for the Affirmative Action Plan for 1996-1997.

### The American Institute of Physics--Discussion of Goals (1995)

After analyzing our Affirmative Action plan and looking at the utilization analysis, it has come to the attention of the American Institute of Physics (AIP) that underutilization of minorities and females exist in the following job group:

Senior Managers (101)      Female and Minority

Sr. Professionals (201)      Female

Other Professionals (202)      Minority

The American Institute of Physics has been and will continue to be an equal opportunity employer. Our goals for increasing utilization of the above groups will include:

- ▶ Broadening the scope of our recruiting efforts. This will include expanding our recruiting outlets and resources such as utilizing the Internet, Department of Labor, and community resources for job postings.
- ▶ Exploring diversity training and continue to monitor hiring process. AIP is looking into offering diversity training for hiring managers and supervisors.
- ▶ Examining and identifying internal candidates for open positions and career development. This will include continuing cross job training, development of skills, and promotion of existing tuition reimbursement program.

## RESPONSIBILITY FOR IMPLEMENTATION

### A. Executive Management Responsibility

As the representative of executive management, the EEO Coordinator has primary responsibility and accountability for implementing, directing and monitoring this Affirmative Action Plan.

1. Implementing the affirmative action programs set forth in this Plan, including the development of policy statements and related internal and external communication procedures to disseminate those policy statements.
2. Developing and supervising the presentation of our equal employment opportunity policy during the supervisory training and new employee orientation programs, which may include question-and-answer sessions for supervisors and employees answering their questions about this Affirmative Action Plan.
3. Designing and implementing an audit and reporting system that will accomplish the following:
  - (i) Measure the effectiveness of our affirmative action programs.
  - (ii) Indicate when remedial action is needed.
  - (iii) Determine the degree to which our goals and objectives have been attained.
4. Advising management and supervisory personnel on developments in the laws and regulations governing equal employment opportunity.
5. Serving as liaison between the Company and all enforcement agencies.
6. Identifying problem areas and establishing goals and objectives to remedy underutilization in major job groups, if any underutilization exists.
7. Conferring with community organizations representing women, minorities, veterans, the disabled and older workers.



8. Auditing periodically our on-the-job training, hiring and promotion patterns to remove impediments to attainment of the Company's goals and objectives.
9. Rating supervisory employees based, in part, upon their efforts and success in furthering the goal of equal employment opportunity, and informing supervisory employees of this evaluation practice.
10. Discussing periodically the Company's commitment to equal employment opportunity with managers, supervisors, and employees. During these discussions, the EEO Coordinator will stress the importance of affirmative action, as well as nondiscrimination.
11. Reviewing the qualifications of all employees to insure that minorities and women are given full opportunities for transfers, promotions and training.
12. Providing access to career counseling for all employees.
13. Conducting periodic audits to ensure that the Company is in compliance with federal and state laws and regulations requiring:
  - (i) Proper display of posters explaining the Company's obligation to engage in nondiscriminatory employment practices.
  - (ii) Integration of all facilities which we maintain for the use and benefit of our employees.
  - (iii) Maintenance of comparable facilities, including locker rooms and rest rooms, for employees of both sexes.
  - (iv) Providing full opportunity for advancement and encouraging minority and female employees to participate in educational, training, recreational and social activities sponsored by the Company.
14. Counseling supervisors and managers to take actions necessary to prevent harassment of employees placed through affirmative action efforts and to eliminate the cause of such complaints. Further, the EEO Coordinator will

counsel supervisors and managers not to tolerate discriminatory treatment of any employee by another employee or supervisor and to report all complaints or incidents to him.

15. Establishing an internal complaint system that will enable employees to discuss complaints with the EEO Coordinator whenever they feel that they are being discriminated against on the basis of race, color, religion, sex, national origin, disability or veterans' status.
16. Serving as liaison between the Company and community organizations representing minorities, women, veterans, the disabled and older workers.
17. Developing expertise and knowledge of equal employment opportunity guidelines and regulations in order to advise and update top management and supervisory personnel concerning developments affecting our equal employment opportunity program.

B. The Responsibilities of Supervisors and Managers

All supervisors and managers must share in the day to day responsibility for implementing the affirmative action programs set forth in this plan. Specifically, they must endeavor to:

1. Respond to inquiries about our Affirmative Action and Equal Employment Policy, after consulting with our EEO Coordinator.
2. Assist our EEO Coordinator during the investigation of allegations of discrimination.
3. Participate in recruitment and accommodation efforts designed to enable disabled individuals, disabled veterans and others to secure employment and to advance to positions for which they are qualified.
4. Ensure that all federal and state posters explaining the laws prohibiting discrimination are properly displayed.
5. Participate in the development and implementation of affirmative action programs.

## DISSEMINATION OF EQUAL EMPLOYMENT POLICY

### I. Internal Dissemination

The Company will take the following actions to disseminate its Affirmative Action and Equal Employment Policy, as appropriate, on a regular and continuing basis.

A. Including the Affirmative Action and Equal Employment Opportunity Policy statement in its policy manual and employee handbook, as published. A copy of our EEO Policy, which is contained in our Employee Handbook, is attached at the end of this section.

B. Meeting with supervisory personnel to explain the intent of the Affirmative Action and Equal Employment Policy and their individual responsibilities for its implementation. We conducted supervisory training for all management about equal employment opportunity, affirmative action and sexual harassment during Plan Year 1995 and have continued the training into Plan Year 1996. We have attached information relating to our supervisory training at the end of this section.

C. Scheduling special meetings with employees or using Company newsletters to discuss and explain individual employee responsibilities or opportunities under the affirmation action program. During the current plan year we will be conducting

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training for all employees about our affirmative action program and equal employment opportunity in the workplace.

D. Discussing our equal employment policy during any orientation programs we hold, at which time all new employees (and if applicable, transferred and promoted employees) will be advised of our commitment to affirmative action and equal employment opportunity. Our Affirmative Action and Equal Employment Opportunity Policy statement and policy statements affirmatively supporting the employment of minorities, veterans, the disabled and women will be explained during these sessions. During these orientation sessions a management representative from various areas of the Company, including Human Resources, explains the function of their department. Our Affirmative Action and Equal Employment Opportunity Policy statement and policy statements affirmatively supporting the employment of minorities, veterans, the disabled and women are explained during these sessions. We have attached at the end of this section an "Overview of New Employee Orientation Process", which includes a copy of our "New Employee Checklist," and addresses equal employment opportunity and affirmative action in the workplace.

E. Posting the Affirmative Action and Equal Employment Policy, along with all required State and federal informational posters, on our bulletin boards, and updating such posters as required. Our "Affirmative Action and Equal Employment Opportunity Policy Statement", "Invitation to Vietnam Era and

IDENTIFICATION OF PROBLEM AREAS (DEFICIENCIES)  
BY ORGANIZATIONAL UNIT AND BY JOB GROUP

I. UNDERUTILIZATION

The EEO Coordinator conducted a Utilization Analysis for the 1996 Plan Year in which she compared the workforce representation of minorities and females to their statistical availability by job group. The Utilization Analysis led the Company to identify the following areas of underutilization:

Females are statistically underutilized in job groups 101 (Senior Managers) and 201 (Senior Professionals).

Minorities are statistically underutilized in Job Group 202 (Other Professionals Technicians).

The Company is addressing these potential problem areas by establishing goals which we will attempt to achieve through specific action oriented programs, which are described in the section of this plan entitled "Action Oriented Programs." Our Utilization Analysis and Goals are contained behind the tabs, so named, in this affirmative action plan.

II. ADVERSE IMPACT

To determine if our selection procedures have an adverse impact upon minorities and females during the first six months of our 1996 Plan Year, we conducted an adverse impact analysis upon our selection decisions. We compared the selection ratios of minorities and females to those of non-minorities and males, respectively, in the areas of hiring, promotion and termination. Through this analysis we discovered no areas for this time period of statistically significant adverse impact.

As a result of our adverse impact analysis, we examined each of the selection decisions that occurred in job groups where adverse impact was discovered as described in the Action Oriented Programs section of our plan. Furthermore, a full impact ratio analysis of our selection decisions and a narrative discussion of the legitimate business reasons supporting our decisions is found behind the "Jaar Analysis, Impact Ratio Analysis and Placement Analysis" tab.

III. IN GENERAL

In addition to the above, the EEO Coordinator will, on an annual basis, as applicable, identify potential problem areas in the total employment process, which may include review of the following areas:

- A. Composition of the workforce by minority group status and sex.

- B. Composition of applicant flow by minority group status and sex.
- C. Overall employee selection process including position specifications, application forms, interviewing procedures, test administration, test validity, referral procedures, final selection process, and other employee selection procedures.
- D. New hires, promotions, terminations, etc.
- E. Utilization of training, recreation and social events and other programs that are sponsored by the Company.
- F. Technical phases of compliance with laws prohibiting discrimination in employment and promoting affirmative action programs, e.g., retention of applications, notifications to subcontractors, etc.
- G. "Underutilization" of minorities or women in specific job groups.
- H. Lateral or vertical movement of minority or female employees occurring at a lesser rate than that of non-minority or male employees.
- I. The selection process eliminating a significantly higher percentage of minorities or women than non-minorities or men.
- J. Application and other preemployment evaluation forms or procedures not in compliance with federal or state law.
- K. Position descriptions inaccurate in relation to actual functions and duties of that particular job.
- L. De facto segregation, by race or sex, existing in job titles or job groups.
- M. Seniority provisions contributing to overt or inadvertent discrimination by minority group status or sex.
- N. Non-support of our affirmative action and equal employment programs and policies by managers, supervisors or employees.
- O. Minorities or women significantly underrepresented in training or career improvement programs.
- P. Lack of formal techniques for evaluating effectiveness of the programs set forth in this Plan.

**From:** Susan Funk  
**To:** SBENKA, JBARKER, GCOLLINS, PELLIOT, TFEDER, CHARRI...  
**Date:** 18 Sep 1997 (Thu) 13:29  
**Subject:** Additional Agenda items...

I have been asked to e-mail this to all of you.

-- Susan

Here are some critical topics we would like to see on the agenda for next week's Content Retreat.

(1) Revised editorial structure: implementation of the long-deferred editorial board to increase staff's participation in editorial function and decision making.

While some may regard this as "process" and not a valid part of this "content" retreat, this step is essential for any meaningful changes in content to be successfully implemented. PT has a highly talented staff that is frustrated by the current structure, which prevents the staff from making a significant and ongoing contribution to enhancing the magazine's quality. Implementing the editorial board is the best way to make the magazine's content more timely, lively, and interdisciplinary.

All the editorial staff should be part of the editorial board.

(2) Revised outlook: an outlook that is more independent, more daring, more thought-provoking, more representative of diverse views in the physics community, more appealing to younger readers, more responsive overall not just to our current readers but to the additional readers we would like to have, more competitive.

(3) Added functions: to provide a forum for debate, to discuss openly issues relevant to the physics community (including controversial or contentious ones), to underscore the social context and relevance of physics.

(4) Added department: creation of "reader viewpoint" feature in which PT publishes reader responses to questions formulated by the staff.

How this would work: In one issue we publish the topic on which we want readers to give their opinions. In a later issue, we publish a representative sampling of those opinions. Such a feature would create a lot of reader interest and could play a valuable role in the society of physicists. Our topics and the subsequent opinions could become the talk of physics coffee rooms and pre-colloquium gatherings.

(5) Revised departments: discontinue reporting of awards and job changes.

The undersigned believe that it is essential that these topics be discussed at the content retreat.

Judy Barker, Graham P. Collins, Chas Day, Paul Elliott, Toni Feder, Jean Kumagai, Elliot Plotkin, Jeff Schmidt.

16 March 1998

Dear Graham,

At the Physics Today staff meeting on 3 March, the editor announced your upcoming departure and called it simply "the big news." We found that characterization offensively neutral. The resignation of a dedicated, long-time staff member is not just "news"; it is a huge loss for both the staff and the readers of the magazine, and it is a failure on the part of the magazine. We are extremely sorry you are leaving Physics Today.

The fact that those in charge are not encouraging you to reconsider is consistent with their behavior toward you over the months, and it leads us to believe that they are not 100% unhappy about your resignation. We think they are fully aware and appreciative of your extraordinary dedication and hard work. But we think they nevertheless have mixed feelings about your presence on the Physics Today staff because you have been an outspoken voice for change at the magazine. We share your frustration over management's continued resistance to badly needed improvements, and so we find your decision to resign quite understandable. Nevertheless, we are sorry to lose you.

Of course, driving away people who point out problems will make for a seemingly smoother operation. But such maintenance of appearances comes at a very high price, because problems that are not clearly exposed cannot be adequately addressed or corrected. We have all seen this in the grossly mismanaged effort to prepare the 50th anniversary issue of the magazine. After each of the many meetings that we have had on this special issue -- meetings at which staff suggestions have been routinely ignored and important decisions routinely deferred -- staff members have whispered to each other privately, in the strongest possible terms, about the absurd amount of time and money being wasted. Nearly everyone agrees that the effort is being grossly mismanaged, but because no one has felt safe enough to bring the matter out into the open at a meeting, there has been no real discussion of how the effort could be better organized and executed. And so after all this time the managers have done nothing to improve the way it is being managed.

During the past year, Physics Today management has moved toward a more repressive work environment and toward a love-it-or-leave-it policy. As you know all too well, there is now much less pretense that "improve it" is a realistic option. Management has become suspicious of anything that could lead to change, and they act against it no matter what the cost to morale or to the readers and the physics community. Take, for example, Steve Benka's recent order forbidding private conversations between staff members at work and declaring that all conversations between staff members must be open to management supervision. Although



Charles Harris later told someone on the staff that this totalitarian measure would not be enforced, it has not been officially retracted, and so the chill remains.

Almost four months ago the Physics Today advisory committee warned that "PT could experience severe losses in its editorial staff if morale issues are not being addressed or are being addressed in a cursory manner. This issue needs continued and heightened attention from management." Physics Today management chose to ignore this warning, and now with your departure we are suffering the predicted consequence. (The magazine's loss of Susan Funk, who quietly cleaned out her desk on Friday 6 March and never came back, was also the result of frustration, we think, with the impediments to fashioning her editorial assistant position into something more than a dead-end job.)

Those in charge should not forget that Physics Today is a trust of the physics community. To needlessly lose dedicated and experienced staff members, especially those who make the extra effort to improve the magazine and the workplace, is to squander the physics community's valuable resources.

We hope some way will be found to keep you at Physics Today, although we realize that this is unlikely to happen. We have been fortunate to have you as a colleague, and we gained much from your honesty and insight. We hope you keep up the spirit in whatever you do.



# **DISCIPLINED MINDS**

A CRITICAL LOOK AT SALARIED  
PROFESSIONALS AND THE SOUL-BATTERING  
SYSTEM THAT SHAPES THEIR LIVES

**JEFF SCHMIDT**

**ROWMAN & LITTLEFIELD PUBLISHERS, INC.**  
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# INTRODUCTION

This book is stolen. Written in part on stolen time, that is. I felt I had no choice but to do it that way. Like millions of others who work for a living, I was giving most of my prime time to my employer. My job simply didn't leave me enough energy for a major project of my own, and no one was about to hire me to pursue my own vision, especially given my irreverent attitude toward employers. I was working in New York City as an editor at a glossy science magazine, but my job, like most professional jobs, was not intellectually challenging and allowed only the most constrained creativity. I knew that if I were not contending with real intellectual challenges and exercising real creativity—and if I were not doing anything to shape the world according to my own ideals—life would be unsatisfying, not to mention stressful and unexciting. The thought of just accepting my situation seemed insane. So I began spending some office time on my own work, dumped my TV to reallocate some of my time at home, and wrote this book. Not coincidentally, it is about professionals, their role in society, and the hidden battle over personal identity that rages in professional education and employment.

The predicament I was in will sound painfully familiar to many professionals. Indeed, generally speaking, professionals today are not happy campers. After years of worshipping work, many seemingly successful professionals are disheartened and burned out, not because of their 70-hour workweeks, but because their salaries are all they have to show for their life-consuming efforts. They long for psychic rewards, but their employers' emphasis on control and the bottom line is giving them only increased workloads, closer scrutiny by management and unprecedented anxiety about job security. In this way the cold reality of employer priorities has led to personal crises for many of this country's 21 million professionals.

Burned-out professionals may not be immediately obvious to the casual observer, because typically they stay on the job and maintain their usual high level of output. But they feel like they are just going through the motions. They have less genuine curiosity about their work, feel less motivated to do it and get less

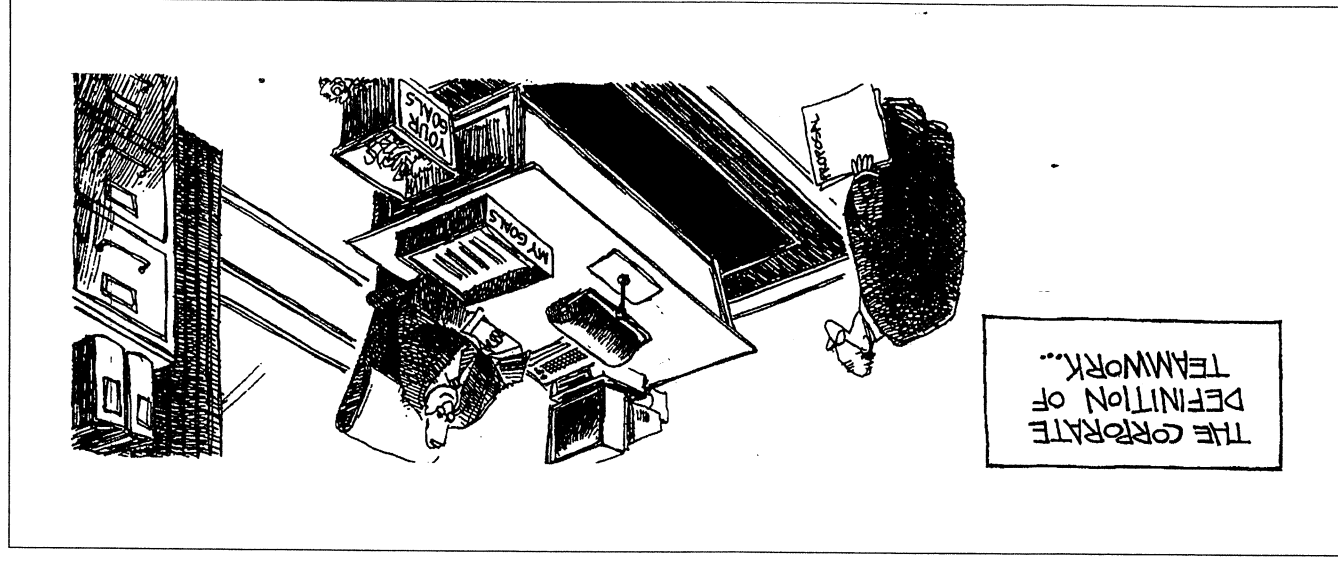
pleasure from it. The emotional numbness inevitably spreads from their work lives into their personal lives. According to Herbert J. Freudenberger, the New York psychologist who coined the term burnout in the mid-1970s, the personal consequences are wide-ranging and profound: cynicism, disconnection, loss of vitality and authenticity, decreased enjoyment of family life, anger, strained relationship with spouse or partner, divorce, obsessive behavior such as "workaholicism," chronic fatigue, poor eating habits, neglect of friends, social isolation, loneliness—and the list of symptoms goes on. Freudenberger tells me he has seen a big increase in career burnout among professionals in the past twenty years. Ironically, such depression is most likely to hit the most devoted professionals—those who have been the most deeply involved in their work. You can't burn out if you've never been on fire.

The problem shows no sign of easing. In fact, the ranks of troubled professionals are swelling as members of Generation X finish school and rack up a few years in the workforce. Many Xers, having observed the unfulfilling work ethic of their baby boom predecessors, want their own working lives to be fun and meaningful from the get-go. Starting out with priorities that took boomers a decade to figure out, but in no better position to act on those priorities, Xers are simply having career crises at an earlier age. Clearly, there is an urgent need to understand why career work so often fails to fulfill its promise.

I argue that the hidden root of much career dissatisfaction is the professional's lack of control over the "political" component of his or her creative work. Explaining this component is a major focus of this book. Today's disillusioned professionals entered their fields expecting to do work that would "make a difference" in the world and add meaning to their lives. In this book I show that, in fact, professional education and employment push people to accept a role in which they do *not* make a significant difference, a politically subordinate role. I describe how the intellectual boot camp known as graduate or professional school, with its cold-blooded expulsions and creeping indoctrination, systematically grinds down the student's spirit and ultimately produces obedient thinkers—highly educated employees who do their assigned work without questioning its goals. I call upon students and professionals to engage in just such questioning, not only for their own happiness, but for society's sake as well.

This book shows that professional education is a battle for the very identity of the individual, as is professional employment. It shows how students and working professionals face intense pressure to compromise their ideals and sideline their commitment to work for a better world. And it explores what individuals can do to resist this pressure, hold on to their values and pursue their social visions. People usually don't think of school and work in terms of such a high-stakes struggle. But if they did, they would be able to explain why so many professional training programs seem more abusive than enlightening, and why so many jobs seem more frustrating than fulfilling.

I decided to write this book when I was in graduate school myself, getting a PhD in physics, and was upset to see many of the best people dropping out or



Non Sequitur by Wiley

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being kicked out. Simply put, those students most concerned about others were the most likely to disappear, whereas their self-centered, narrowly focused peers were set for success. The most friendly, sympathetic and loyal individuals, those who stubbornly continued to value human contact, were handicapped in the competition. They were at a disadvantage not only because their attention was divided, but also because their beliefs about big-picture issues such as justice and social impact caused them to stop, think and question. Their hesitation and contemplation slowed them down, tempered their enthusiasm and drew attention to their deviant priorities, putting them at a disadvantage relative to their unquestioning, gung-ho classmates. Employers, too, I realized, favored people who kept their concerns about the big picture nicely under control, always in a position of secondary importance relative to the assigned work at hand. Thus I saw education and employment as a self-consistent, but deeply flawed, system. I wrote this book in the hope of exposing the problem more completely and thereby forcing change.

A system that turns potentially independent thinkers into politically subordinate clones is as bad for society as it is for the stunted individuals. It bolsters the power of the corporations and other hierarchical organizations, undermining democracy. As I will explain in detail, it does this by producing people who are useful to hierarchies, and only to hierarchies: uncritical employees ready and able to extend the reach of their employers' will. At the same time, a system in which individuals do not make a significant difference at their point of deepest involvement in society—that is, at work—undermines efforts to build a culture of real democracy. And in a subordinating system, organizations are more likely to shortchange or even abuse clients, because employees who know their place are not effective at challenging their employers' policies, even when those policies adversely affect the quality of their own work on behalf of clients.

This book is intended for a broad range of professionals, nonprofessionals and students, and for anyone interested in how today's society works. It is for students who wonder why graduate or professional school is so abusive. It is for nonprofessionals who wonder why the professionals at work are so often insufferable, and who want to be treated with greater respect. It is for socially concerned professionals who wonder why their liberal colleagues behave so damn conservatively in the workplace. (Chapter 1 explains how professionals are fundamentally conservative even though liberalism is the dominant ideology in the professions.) It is for individuals who are frustrated by the restrictions on their work and troubled by the resulting role they play—or don't play—in the world. It is also for those who simply find their careers much less fulfilling than they had expected and aren't exactly sure why.

Disillusioned lawyers, doctors, financial analysts, journalists, teachers, social workers, scientists, engineers and other highly educated employees are looking for a deeper understanding of why their lives are stressful and feel incomplete. My hope is that readers will find such an understanding in these pages, along with effective strategies for corrective action. If you are a professional, coming

to understand the political nature of what you do, as part of an honest reassessment of what it really means to be a professional, can be liberating. It can help you recover your long-forgotten social goals and begin to pursue them immediately, giving your life greater meaning and eliminating a major source of stress. It can help you become a savvy player in the workplace and reclaim some lost autonomy. And, ironically, it can help you command greater respect from management and receive greater recognition and reward, without necessarily working harder.

If you are a student, understanding the political nature of professional work can help you hold on to your values and moral integrity as you navigate the minefields of professional training and, later, employment. For students trying to get through professional training intact, this book can serve as something of a survival guide, explaining the frightening experiences and warning of what lies in store.

If you are a nonprofessional, you experience even more lack of control, unfulfilling work, insecurity and other sources of stress than do professionals. As a consequence, the toll on your physical and psychological well-being is even greater than that suffered by professionals. If you want to act individually or collectively to improve your situation, then it pays to know what makes your professional coworkers tick. Such awareness can help you figure out which people you can trust and how far you can trust them. When professional and nonprofessional employees maintain solidarity in the workplace, they can cover for each other and get more concessions from their employer. But any alliance between unequal partners is doubly risky for the less powerful party—in this case the nonprofessionals, who are at the bottom of the workplace hierarchy. By understanding professionals, you reduce the chances of being double-crossed by them. You'll be treated with more respect, too.

Whatever your occupation, you have to deal with a variety of professionals when you are off the job. Most of these professionals work for others, not directly for you. Whether you visit an HMO, send kids to school, request a government service, see a counselor, get assistance from a social worker, deal with a lawyer, file a consumer complaint or contact a local TV station or newspaper, understanding the political nature of professional work will help you get better service. If you are involved in an independent organization working for social change, you have to contend not only with professionals in the corporations or agencies that your group confronts, but also with professionals advising your own organization. Groups that simply trust professionals without truly understanding them are very likely to be misdirected or sold out by those professionals.

And, of course, everyone deals with professionals indirectly, too. For instance, newspapers, magazines, radio and television are filled with supposedly objective news reports, analyses and studies prepared by professionals. What should you believe? To truly understand the output of these or other professionals, you first need to understand the political nature of the professional's role at work.

# DISCIPLINED MINDS

## PART ONE

### PROFESSIONALS

The political nature of professional work is this book's unifying theme. To make the case that the professional's work is inherently political, I examine not only professionals and what they do (part one: chapters 1 to 6), but also the system that prepares them to do it (part two: chapters 7 to 13) and the battle that one must fight to be politically independent (part three: chapters 14 to 16).

My hope is that whether you are a professional, a nonprofessional or a student, you will find here an unsettling but empowering new way of looking at yourself, your colleagues, the institution that employs or trains you, and society as a whole. This book strives to arm you with a very practical analytical tool that you can use to your advantage in whatever individual and collective struggles you find yourself in as an employee, student, organization member, consumer or citizen.

*A note on pronouns.* To make less frequent use of phrases such as "he or she," in part one I will sometimes use female pronouns instead, and in part two I will sometimes use male pronouns instead. Today most professionals are women, and the female majority, which stood at 53% in 1997, is growing. Women have long made up large majorities in professions with relatively low social status and salary; thus teachers, social workers, registered nurses and librarians have been said to labor in the subprofessions. But today the proportion of women is increasing throughout the professions. Nearly half the students now in medical school and law school, for example, are women, up from about 9% in 1970.

*A note on references.* Many of the references listed at the end of each chapter make for fascinating reading. I encourage you to look further into topics in this book that interest you, and so I have given lots of references and have spelled things out to make them as easy as possible to look up. Time spent with these materials will surely be thought provoking, informative and entertaining.





STATE OF MARYLAND  
DEPARTMENT OF LABOR, LICENSING AND REGULATION  
OFFICE OF UNEMPLOYMENT INSURANCE

NOTICE OF BENEFIT DETERMINATION

SSN:  
DATE MAILED: 06/26/2000  
BENEFIT YEAR BEGINS: 06/04/2000

COLLEGE PARK CLAIM CENTER  
P.O. BOX 1901  
COLLEGE PARK MD 20740

MAIL REQUEST FOR APPEAL TO  
LOCAL OFFICE ADDRESS ABOVE

JEFF SCHMIDT  
3003 VAN NESS ST NW APT W406  
WASHINGTON DC 20008 4830

ISSUE SIMPLE MISCONDUCT  
SECTION OF LAW 8-1003  
DATE OF DETERMINATION 06/26/2000  
SPECIALIST ID EWCP1A

AMERICAN INSTITUTE OF PHYSICS  
INCORPORATED  
1 PHYSICS ELLIPSE  
COLLEGE PARK MD 20740 3842

THE LAST DAY TO FILE AN APPEAL IS: 07/11/2000  
(IF THIS DECISION IS CHANGED ON APPEAL, THE CLAIMANT  
WILL BE REQUIRED TO REPAY ANY RESULTING OVERPAYMENT.)

DETERMINATION:

THE CLAIMANT WAS DISCHARGE FROM AMERICAN INSTITUTE OF PHYSICS ON 6/2/00  
BECAUSE IT WAS ALLEGED THAT THE CLAIMANT WROTE A BOOK ON COMPANY TIME.

INSUFFICIENT INFORMATION HAS BEEN PRESENTED TO SHOW THAT THE CLAIMANT'S  
ACTIONS CONSTITUTED MISCONDUCT IN CONNECTION WITH THE WORK. AS A RESULT, IT IS  
DETERMINED THAT THE CIRCUMSTANCES SURROUNDING THE SEPARATION DO NOT WARRANT  
A DISQUALIFICATION UNDER SECTION 8-1002 OR 8-1003 OF THE MARYLAND UNEMPLOYMENT  
INSURANCE LAW.

BENEFITS ARE ALLOWED, IF OTHERWISE ELIGIBLE.

**APPEAL RIGHTS:**

CLAIMANT AND EMPLOYER: Section 8-509 of the Maryland Unemployment Insurance Law provides the right to appeal this determination. The appeal must be in writing and may be submitted in person or mailed to the Local Office within (15) days of the determination. If mailed, the appeal must be postmarked within (15) days of the date of this determination. A claimant who appeals a determination and remains unemployed must continue to file timely claims for each week. NO LATE CLAIMS WILL BE ACCEPTED. If an appeal decision results in reversal or modification of this determination, the claimant may be paid benefits previously denied or may be overpaid benefits previously paid.

SEE BACK OF FORM FOR PROVISIONS OF THE LAW

STATE OF MARYLAND  
DEPARTMENT OF LABOR, LICENSING AND REGULATION  
OFFICE OF UNEMPLOYMENT INSURANCE  
1100 N. EUTAW STREET, BALTIMORE, MD. 21201

Given to  
Tom McCarthy  
27 Dec. 2000

SSN: [REDACTED]

DATE: 06/12/2000

JEFF SCHMIDT  
3003 VAN NESS ST NW APT W406  
WASHINGTON DC 20008-4830  
|||||

NOTICE OF AVAILABLE BENEFIT WEEKS

YOUR NEXT WEEK ENDING DATE(S) TO FILE ARE: 06/17/2000 06/24/2000

YOU MAY FILE FOR THESE WEEK(S) AFTER 06/24/2000 BY CALLING THE CLAIMANT TELEPHONE INFORMATION SERVICE.

YOU MUST CONTINUE TO FILE YOUR TELECERTS FOR EACH WEEK THAT YOU ARE UNEMPLOYED AND REQUESTING PAYMENT OF BENEFITS.

WORK SEARCH CONTACTS ARE SUBJECT TO VERIFICATION. FALSE INFORMATION MAY RESULT IN DENIAL OF BENEFITS, FINES, AND/OR IMPRISONMENT.

NO BENEFITS WILL BE PAID PENDING REVIEW OF YOUR CLAIM BECAUSE OF INFORMATION THAT YOU MAY NO LONGER BE ELIGIBLE. YOU WILL GET AN APPOINTMENT NOTICE.  
WORK SEARCH CONTACTS ARE SUBJECT TO VERIFICATION. FALSE INFORMATION MAY RESULT IN DENIAL OF BENEFITS, FINES AND/OR IMPRISONMENT.

ALL INQUIRIES CONCERNING YOUR CLAIM SHOULD BE DIRECTED TO THE CLAIMANT TELEPHONE INFORMATION SERVICE BY CALLING THE APPROPRIATE NUMBER LISTED BELOW:

- Call toll free from anywhere in Maryland on a touch tone or rotary phone. • Automated voice response information is available 24 hours a day, seven days a week. • Service representatives are available to help with special problems or questions during business hours, Monday through Friday from 8:00 a.m. to 4:15 p.m.

(410) 949-0022 From Baltimore Area  
and Out-Of-State  
1-800-827-4839 Toll Free in Maryland only

(410) 767-2727 TDD From Baltimore Area  
and Out-Of-State  
1-800-827-4400 TDD Toll Free in Maryland only



DECLARATION OF WILLIAM SWEET

William Sweet deposes and says:

(1) My name is William Sweet. My home address is 469 Marlborough Road, Brooklyn, New York 11226.

(2) I currently work at IEEE Spectrum magazine as Senior News Editor. My business address is 3 Park Avenue, 17th Floor, New York, N.Y. 10016.

(3) I have been a journalist (writer/editor) for 25 years. My first jobs were with a financial newsletter in Manhattan, then Congressional Quarterly Inc. in Washington, D.C. I began working at Physics Today as an associate editor in March 1984 and worked at the magazine until 1992 or 1993. My immediate supervisor was Gloria Lubkin, who was News Editor and then Editor-in-Chief.

(4) Upon being hired, I asked the Editor in Chief, Hal Davis, whether I could pursue freelance projects while I worked at Physics Today. Davis said that that would be fine as long as I did not attach Physics Today or the American Institute of Physics to anything I wrote. I also confirmed with Human Resources, that I would have unlimited long distance telephone privileges. At the time, Theresa Braun was the director of Human Resources.

(5) Physics Today had an exact way of defining peoples' jobs. If you did your job, then you were left alone. Editors were expected to edit two articles a month. Writers were expected to write four pages per month, or one page per week. In theory, if I wrote four pages in one week, I could then do whatever I wanted for the remainder of the month.

(6) While at Physics Today, I worked on a number of different freelance projects while at work, including regular articles for The Bulletin of Atomic Scientists,

which many of my colleagues saw. I worked on these projects openly, often discussing the different projects with co-workers, using my office computer and the magazine's library for research.

(7) In 1989, I wrote a controversial article which was published in MIT's Technology Review, in which I suggested that the Chernobyl accident was actually a nuclear explosion. After it was published, a number of articles were written in response and I received a fair amount of publicity. Soon after, AIP's clipping service collected many articles commenting on my Chernobyl piece. I know this because my colleague, Barbara Levi, who had a similar but slightly more senior job, called me into her office, gave me a large stack of clippings about my Chernobyl article, and said, "this is what happens when you use the term nuclear explosion." I noted that, even though the Chernobyl article itself did not identify me as an editor of Physics Today, or as an employee of AIP, many of the articles did so. No one from management warned, reprimanded, or disciplined me in any way, and I was never told to refrain from writing controversial pieces. I continued my freelance work throughout my time at Physics Today.

(8) In my experience, freelancing on an employer's time (and using an employer's resources) is and was ubiquitous in the newspaper and periodical industry. It generally is taken for granted that reasonably ambitious people will use company time, long-distance telephone privileges, research facilities, and the company's computers, to further their own writing careers. The employer benefits from such a practice as these writers will give the magazine the right of first refusal for publication. Freelance work also can increase a staff writer's stature and lead to valuable spin-off projects for one's employer. -Indeed, my MIT article about Chernobyl led to a tip that resulted in my writing a major investigative piece on a closely related subject, which Physics Today published.

VERIFICATION

I hereby verify under penalty of perjury pursuant to 28 U.S.C. § 1746(2)  
that the statements contained therein are true and correct to the best of my knowledge,  
information and belief.

Executed on March 15, 2001.

  
William Sweet

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The Associated Press

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**June 9, 1989, Friday, AM cycle****SECTION:** Business News**LENGTH:** 512 words**HEADLINE:** Some Scientists in Review Article Call 1986 Explosion a Nuclear Blast**DATELINE:** CAMBRIDGE, Mass.**BODY:**

The nuclear industry said it couldn't happen, but some scientists now believe the 1986 accident at the Soviet Union's Chernobyl power plant exploded like an atomic bomb.

An article in Friday's Technology Review, a journal published by the Massachusetts Institute of Technology, says similar accidents could happen at 13 other nuclear reactors in the Soviet Union.

However, "the possibility of such an accident in a U.S. reactor is vanishingly small," wrote **William Sweet**, a reporter for **Physics Today**, published by the American Institute of Physics.

Sweet gathered his information in interviews with scientists and specialists at the Nuclear Regulatory Commission and the U.S. Department of Energy.

"A runaway nuclear reaction set off a chain of events that severely damaged the reactor core and surrounding structures," Sweet wrote.

"This damage set the stage for a second explosion which was much more violent than the first and almost certainly was a full-fledged nuclear explosion."

Some scientists say the article accurately reports current thinking, but others say it is causing unnecessary alarm.

"To call this a nuclear explosion is very misleading," said Themis Speis, deputy research chief at the NRC.

"The reactor went out of control, but the time it took to raise the temperature and pressure is many orders of magnitude smaller than it takes to get an atomic bomb going," he said.

John Ahearne, former NRC chairman, said, "I wouldn't call it a nuclear explosion."

Harvard University physics Professor Richard Wilson said in the article, "It was a nuclear explosion; there's no doubt, because the ultimate source of energy was nuclear.

"To ever say it was not a nuclear explosion is just plain wrong."

The argument is one of semantics, said Gregory Van Tuyle, a nuclear engineer at the Brookhaven National Laboratory.

The plant was not destroyed by a steam explosion as scientists had believed, but "power grew to very large levels very rapidly," he said. "The phrase 'nuclear explosion' is not inappropriate."

The accident, blamed for the deaths of at least 31 people, injured many more and spread radiation for thousands of miles.

Sweet acknowledged that the reactor at Chernobyl "exploded" far more slowly and with much less energy than a bomb. But, he said, official reports suggest the reactor's fuel formed a critical mass, reacted uncontrollably, melted and vaporized.

It "would be deeply misleading to say that the plant did not blow up like an atomic bomb," he said.

"Ever since the first nuclear power plants were built in the 1950s, the industry has insisted they can't explode like bombs," Sweet said. "Chernobyl casts doubt on whether that is true of all power reactors.

"Of the plants operating in North America, however, only the Canadian plants are susceptible to a Chernobyl-type accident."

In an interview Friday from his New York office, Sweet explained that a Chernobyl-type accident is unlikely in the United States because U.S. commercial reactors use a different type of moderator and have a safer design. WILLIAM SWEET (94%);

office  
←

Document 1 of 3. *Next* ►



MIT REACTS TO COLD FUSION ■ THE GAIA HYPOTHESIS: IS THE EARTH ALIVE? ■

# Technology Review

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

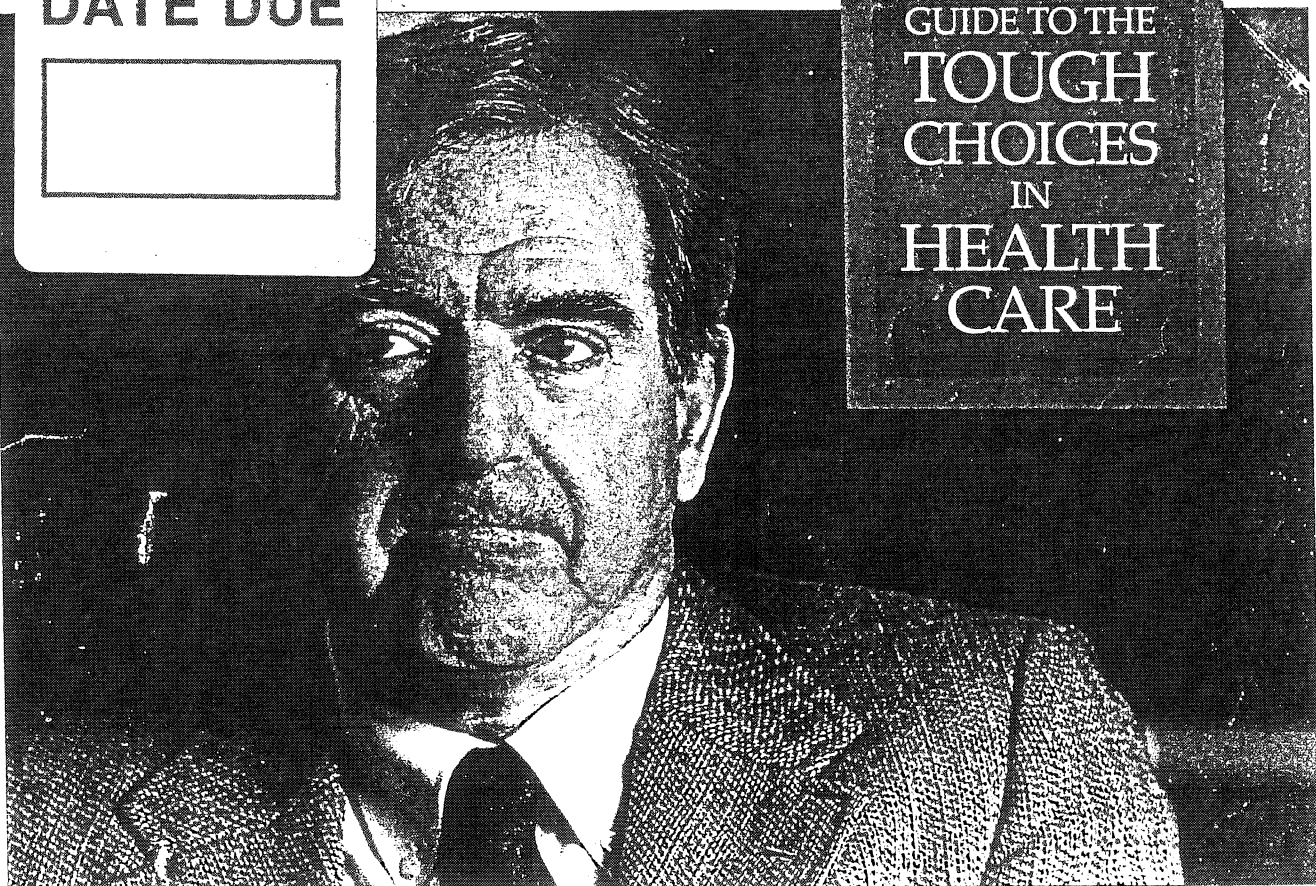
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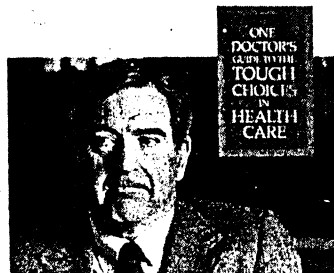


*An Interview with Arnold Relman  
of the New England Journal of Medicine*



# TechnologyReview

IN MIT REVIEW TO COLD FUSION: THE GAIA HYPOTHESIS: IS THE EARTH ALIVE?  
**TechnologyReview**

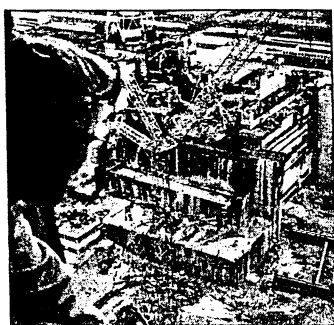


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80 COLD FUSION

## 24 **FIXING THE NATION'S NUCLEAR-WEAPONS REACTORS**

BY JOHN F. AHEARNE

New oversight groups now monitor troubled U.S. defense reactors, but long-term problems remain.

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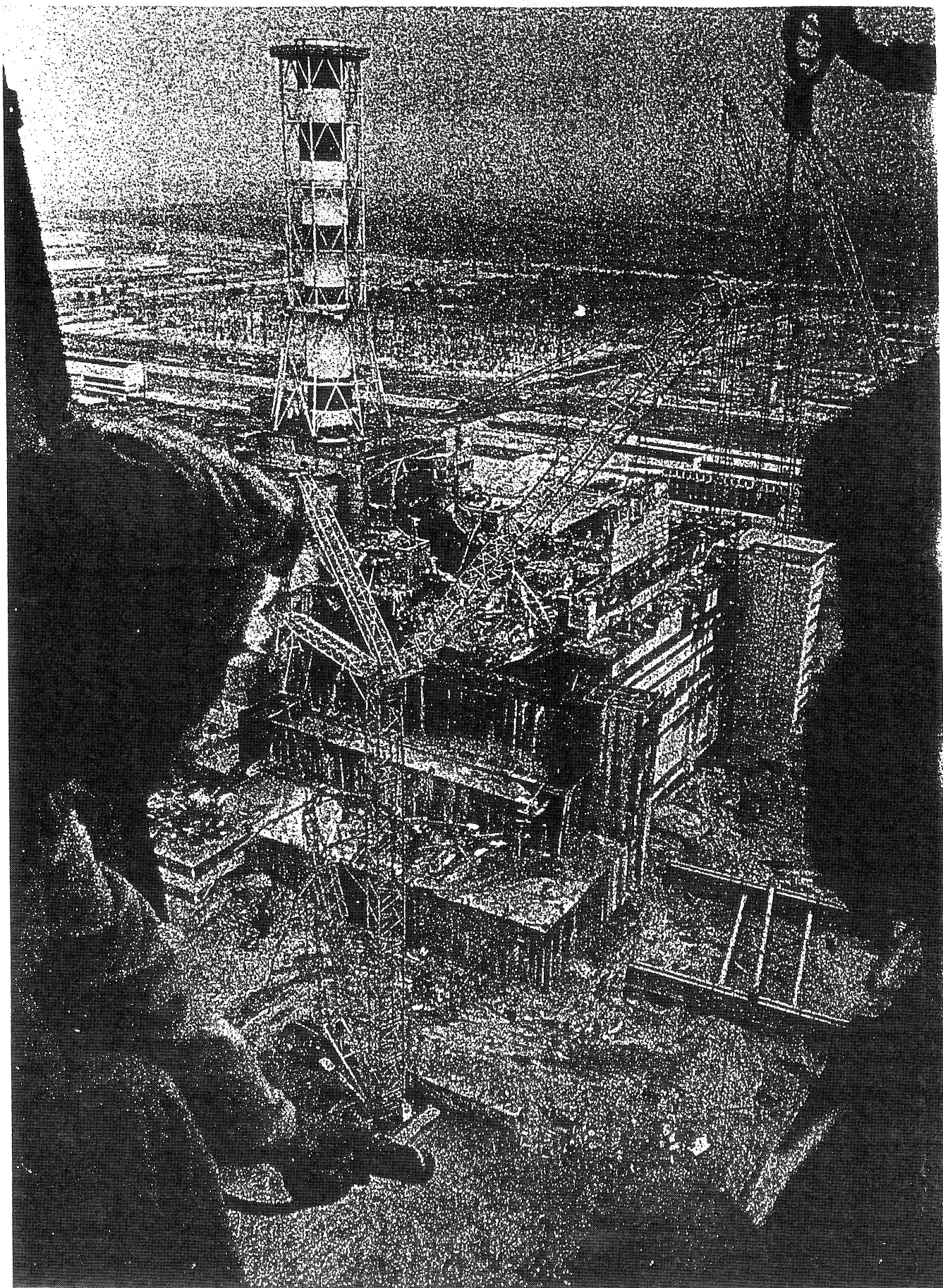
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# Chernobyl

## What Really Happened

*Soviet technical fixes  
adopted since Chernobyl don't  
eliminate the possibility of a recurrence—  
and may make one more likely.*

**T**HREE years after the April 1986 nuclear catastrophe at Chernobyl, this is an opportune time to take stock of the accident, the technical measures the Soviets have taken to improve reactors like those at Chernobyl, and the implications of the accident for other types of reactors. As the shock of the accident has been absorbed, Western experts have become noticeably more willing to voice their concerns, air disagreements about technical issues, and state the truth exactly as they see it.

Soviet officials turned immediately to reactor experts in the West for advice. The Soviets made a remarkably full disclosure of their knowledge about the accident at a September 1986 meeting held under the auspices of the International Atomic Energy Agency in Vienna. During the next two years, they invited at least a dozen outside experts to come to the Soviet Union for a firsthand look.

Until recently, however, the Western analysts talked mainly with each other, and when they re-

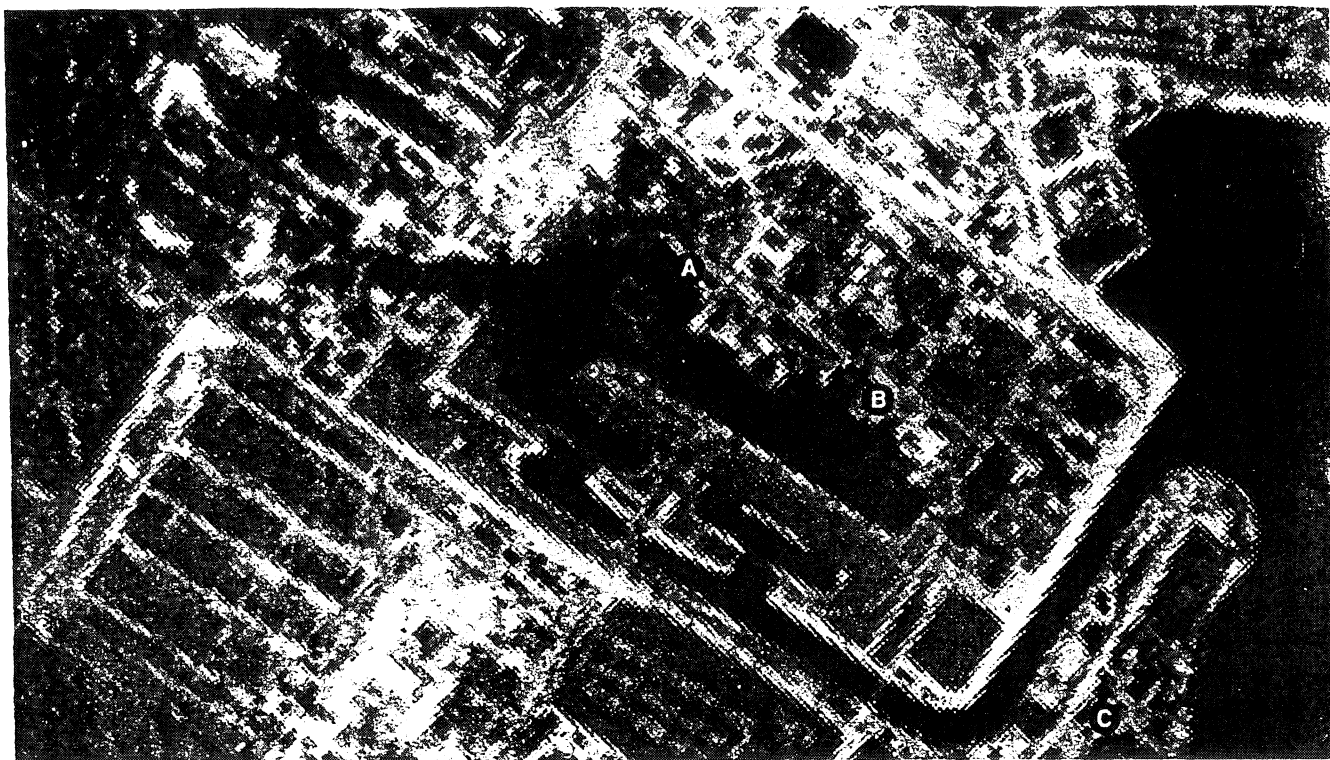
ported their findings in official reports or in articles for the public, they tended to couch their conclusions in cautious bureaucratic language. Obviously, they did not want to jeopardize their delicate relations with the Soviet Union and embarrass their hosts. And they were wary of the impact their statements would have in their own countries.

That reticence has declined with time. To get a snapshot of current expert opinion, I conducted extensive interviews with staff members of the Nuclear Regulatory Commission (NRC) who studied the accident, two former NRC commissioners, members of a Department of Energy (DOE) study team, leading Canadian reactor experts, and scientists from industry, academia, and national laboratories.

What follows represents an effort to reach a consensus view of the accident. The central conclusion is that a runaway nuclear reaction set off a chain of events that severely damaged the reactor core and surrounding structures. This damage set the stage for a second explosion, which was much more violent than the first and almost certainly was a full-fledged nuclear explosion.

Because many factors could have set this chain of

**A technical crew monitors radiation levels over Unit 4 soon after it exploded.**



events in motion, the technical fixes adopted by the Soviets do not preclude the recurrence of an equally catastrophic event at a Chernobyl-type reactor. Some of the fixes may even increase the probability of a future catastrophe.

Ever since the first nuclear power plants were built in the 1950s, the industry has insisted they can't explode like bombs. Chernobyl casts doubt on whether that is true of all power reactors. Of the plants operating in North America, however, only the Canadian plants are susceptible to a Chernobyl-type accident.

The possibility of such an accident in a U.S. reactor is vanishingly small. Here, the worst-case scenario envisages that a loss of coolant would lead to a buildup of heat because of continuing reactions in the fuel. The fuel would melt and burrow through the plant bottom into the earth.

The Chernobyl accident was fundamentally different. After the coolant was lost, or some equally serious event occurred, nuclear reactions escalated rapidly and uncontrollably. They kept doing so until the plant's structure disassembled—that is, until Chernobyl Unit 4 exploded.

### The RBMK Reactor

The Chernobyl reactor is an RBMK, which is a derivative of the reactors built to produce plutonium

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for the first Soviet atomic bombs. Since those plants were military machines, public and occupational safety received relatively short shrift in their design. While the United States sought from the outset to assure civilian control of nuclear technology, and established the NRC in the early 1970s to independently regulate power reactors, Soviet development of both plutonium and power reactors remained under narrow bureaucratic authority until after Chernobyl. As a result, the Soviets designed a reactor that never should have been built, and they failed to familiarize its operators adequately with its defects.

The RBMK is a graphite-moderated, water-cooled reactor, built to be fueled while running. The reaction is driven by neutrons released as uranium atoms split. The uranium fuel is arranged in pins that are contained in 1,661 zirconium-alloy pressure tubes, which are imbedded vertically in a 2,000-ton pile of graphite blocks. The graphite slows down neutrons released by uranium fission, enhancing their ability to induce more additional fissions so the reaction can sustain itself.

Water, pumped up through the pressure tubes, comes to a boil in the middle of the pile, and steam is carried off to the turbine systems that generate electricity. Control rods penetrating the pile regulate the reaction rate—that is, the power level—by capturing neutrons and damping the unit's reactivity.

One of the RBMK's principal defects is that it tends to gain power rather than slow down when water is lost or converts to steam. In all the reactors licensed to operate in the United States, the fission



**Far left: Three days into the accident at Chernobyl, color-enhanced satellite photos depict Unit 4 as a glowing hot spot (A). Also visible are Units 1 and 2 (B), as well as the site where the Soviets probably were building more reactors of the same type (C).**

**Left: Like Unit 4, Unit 1 was an RBMK reactor. The photo shows Unit 1's control board in June, two months after the Unit 4 disaster.**

rate slows if water is lost, so the system tends to be self-correcting. In the RBMK, fissions increase if water converts faster than expected or if there is a sudden leak.

This highly undesirable feature, called a positive-void effect, can make the reactor go out of control. The effect is especially strong if the RBMK is operating at low power. Ironically, the reactor is much more prone to go out of control when it has been in operation for a long period of time and the fuel is relatively depleted.

Aggravating the risks of the positive-void factor is the fact that the unmodified RBMK has a slow and perversely designed control-rod system. As Chernobyl revealed, that system could not be counted on to respond quickly enough to sudden changes in reactivity, and inserting control rods might even increase rather than dampen reactivity.

A third major design defect is the RBMK's inadequate containment. The containment system is predicated on the dubious assumption that the worst-case accident would result from a rupture of a single major water pipe at the bottom of the pile, where water is pumped up through the pressure tubes. Thus, the designers compartmentalized the bottom of the reactor, and the newer versions of the RBMK have a pool underneath. In the event of a tube rupture in the lower part of the reactor, the pool condenses steam, prevents pressure from building up too high, and captures water contaminated by damaged fuel.

The top of the reactor, however, is left relatively defenseless in all the RBMKs built or under con-

struction. While a gigantic steel slab weighing about 1,000 tons seals the top of the reactor, all the pressure and control tubes penetrate this cap. Surprisingly little pressure can lift it, breaking all the pressure tubes and destroying the control mechanism. No kind of containment surrounds the tube, control, and refueling systems at the reactor's top, so if it lifts, radioactive and irradiated materials escape directly into the poorly sealed building and hence into the environment.

According to a calculation by Herbert Kouts at Brookhaven National Laboratory, 6 pounds per square inch (psi) would lift the lid. A rupture of just several of the 1,661 tubes would dump enough boiling liquid into the reactor to exert 1,000 psi.

### The Accident

The immediate events surrounding the destruction of Chernobyl make sense only if it is appreciated that the RBMK was designed to run at virtually full capacity for a year, whereupon it would be shut down for maintenance. Thus, the reactor is designed to face its worst self only when fueled for the first time and twice a year after that, as it is taken out of and put back into service.

At the first fuel loading, problems arise from the fact that "the large enriched uranium fuel load creates many critical masses in the core," as an NRC report puts it. "The control rod system alone is not sufficient to hold the core subcritical for the initial fuel loading. . . . [Therefore,] one supplemental absorber rod is loaded for every six uranium-fueled channels."

When the reactor comes out of operation for annual maintenance and again when it is restarted, it passes through the vulnerable low-power zone in which the positive-void factor is most dangerous. The situation would be particularly risky at shutdown, when the positive-feedback mechanism is even more potent because of high fuel burn-up.

April 25 was the eve of this annual maintenance period. As the crew took the reactor down, they were preparing to test whether residual flywheel energy in the turbines could provide temporary electrical power to control the plant if the reactor lost outside power. Evidently, because of an exceptionally good operating record, the crew members were cocky. And apparently because this test could be performed only during the annual shutdown, they were deter-

*If the second explosion was nuclear,  
it would be deeply misleading to say that Chernobyl  
did not blow up like an atomic bomb.*

mined to get it done. They therefore took a large number of reckless measures that disabled safety systems and put the reactor into its most unstable state.

"The presumption that this was an electro-chemical test with no effect on reactor safety seems to have minimized the attention given to it in safety terms," a report by the International Atomic Energy Agency (IAEA) concluded. "Authority to proceed was given to the station staff without the necessary formal approval by the station safety technology group. . . . The test could have and should have been conducted in such a way that the reactor tripped [shut down] when the test began."

Instead, when the reactor started to lose power before the operators were ready to begin the test, they disabled safety systems in an effort to keep the reactor operating. When the reactor was on the verge of shutting down spontaneously before the test had been completed, they removed virtually all the control rods, boosting the positive-void coefficient to about 1.5 times its normal value. As a result, the fuel load or some part of it went out of control. In less than a second, the reactor's power went from nearly zero to perhaps 50 to 100 times the plant's maximum rated capacity. Fuel melted and interacted

with water and steam, and some fuel probably vaporized. Enough pressure was generated to lift the reactor lid, rupturing all the pressure tubes and control rods.

Descriptions of this initial explosion in the official literature differ significantly in nuance. All refer in some fashion to a steam explosion, but in one way or another they also make clear that a runaway nuclear reaction was the driving force. At least one report seems to suggest that this reaction alone may have sufficed to blow up the reactor building.

Treading cautiously, the NRC report says, "Within the context of a very strong power pulse, the Soviets could visualize an intense fuel/coolant interaction, i.e. a steam explosion."

The IAEA report, based on the evidence and analysis presented by Soviet experts, makes a somewhat more confident assessment: "The continuous reactivity addition by void formation led to a superprompt critical excursion." A superprompt critical excursion is a nuclear reaction that by definition will stop only when the reacting substance blows itself into pieces.

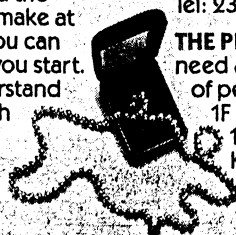
In its report, the Organisation for Economic Cooperation and Development (OECD), which in-

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## THERE'S NOTHING SIMPLE ABOUT A BUSINESS TRIP TO OSAKA

The complexities of doing business in Osaka can be overwhelming. Not only is the language foreign, but the rituals and business practices are quite different from our own. For this reason, the power of having just a little knowledge beforehand should never be underestimated.

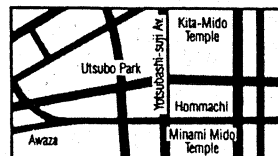
**WORD POWER.** Try to type up all your ideas and the points you want to make at your meetings, so you can hand it out before you start. The Japanese understand written English much better than they do the spoken word.



### DINING FOR DOLLARS.

Kicho is one of the most well-known restaurants in all of Japan. It's also the absolute best, so it's always booked. If you are invited to dine there, cancel all plans and go. 3-23 Korai-bashi, Higashi-ku, Osaka. Tel: 231-1937.

**THE PERFECT GIFT.** If you need a special gift, try a string of pearls from Mikimoto, 1F Shin-Hankyu Bldg. 1-12-39 Umeda, Kitaku.



### OSAKA CENTRAL. AI-

though friendly, Osaka's taxi drivers speak almost no English, so get all your directions written in Japanese before you leave the hotel. It's an enormous, congested city, so make sure to

allow time for traffic delays.

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*The consensus is that improvements in  
RBMK reactors will reduce but not eliminate dangers  
from the "positive-void effect."*

cludes most developed nations, calls the event a "reactivity-driven steam explosion." But elsewhere the same report casts doubt on whether a steam explosion took place at all: "The evidence that a steam explosion occurred during the Chernobyl accident is largely circumstantial although it is generally given as an accepted explanation of the damage observed."

### The Second Explosion

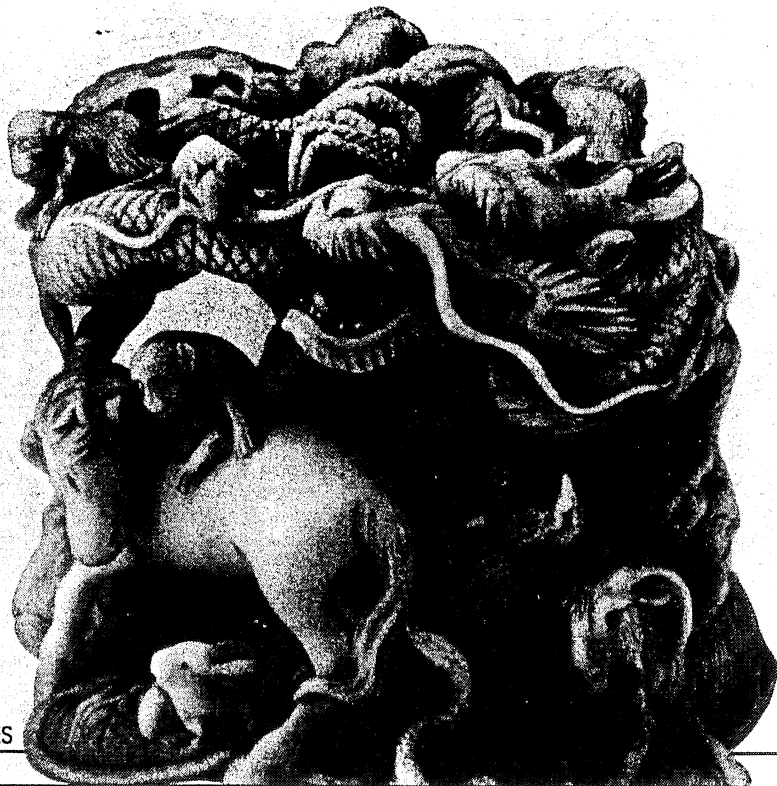
According to eyewitness accounts and evidence presented by the Soviets, a second explosion occurred seconds after the first. Characterizations of this one are even more ambiguous. Some reports steer clear of the second explosion and barely mention it. The IAEA says it is unclear whether it was a second nuclear excursion or a chemical explosion resulting from the reaction of air with hydrogen freed by interactions between zirconium and water. The NRC says the second event, if it occurred, may have followed the plant's destruction and might have been a second nuclear excursion, a hydrogen explosion, or even an echo.

How to describe the second explosion was a sore

point that divided NRC and Department of Energy researchers when they tried to collaborate on a joint report. The DOE group was much more cautious about the precipitating causes of the accident but quite certain that the second explosion was a pure nuclear excursion. The group's view was and is that this explosion was much more powerful than the first, and that it was this explosion that completed the destruction of the plant and blew parts of its core into the upper atmosphere.

DOE's position is based on Soviet data and calculations contained in the IAEA report and presented as a graph insert to the report (*see chart on page 49*). These calculations indicate that the second explosion took the reactor to 400 to 500 times its normal maximum power. The figures are predicated on roughly this interpretation: the first explosion caused the core and surrounding structure to disassemble; and the core or some part of it reconfigured itself, formed into a critical mass, and exploded like a bomb.

When news of the Chernobyl disaster first reached the West, experts speculated that a graphite phenomenon, which had led to the destruction of a British reactor at Windscale in 1957, was the cause. But



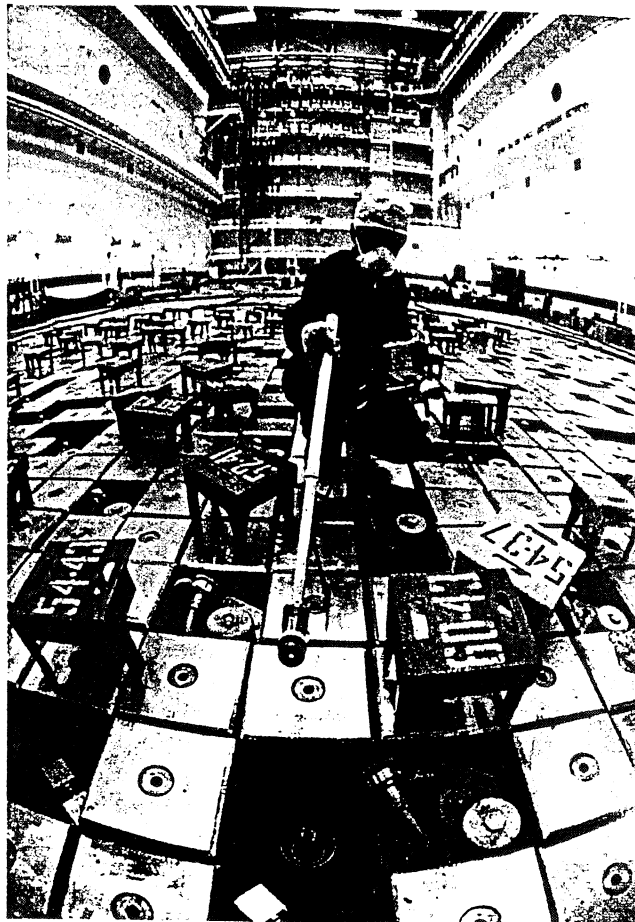
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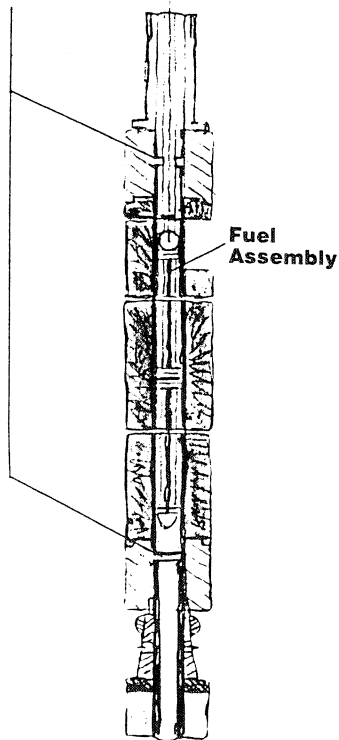
Right: In RBMK reactors, all the control and fuel rods penetrate the top. Surprisingly little pressure can lift this lid, breaking the rods. Here, a worker checks the top of Chernobyl Unit 1 in June 1986.



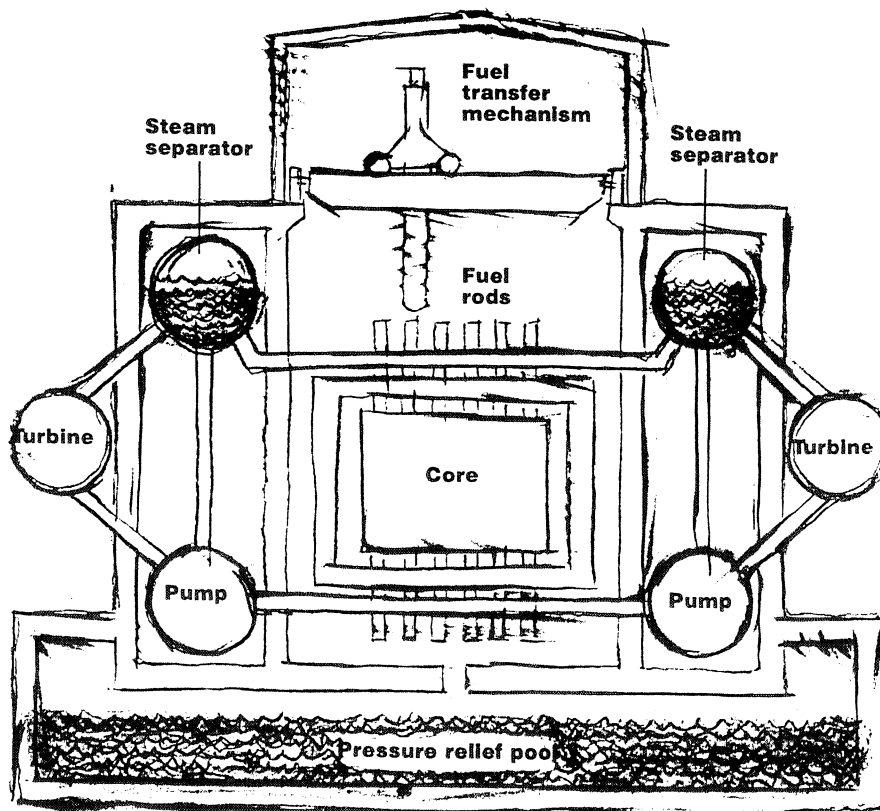
Below left: The design of RBMK fuel rods may be seriously flawed. Abrupt temperature changes could break the sensitive weld that joins an inner zirconium-alloy section to outer steel sections.

Below right: RBMK reactors recirculate water continuously. Pumps on both sides of the central building send water up the fuel rods so the heat turns some of it to steam. Separators then send the water back to the pumps and divert the steam to turbines that generate electricity. In the turbines, the steam recondenses into water, which returns to the pumps.

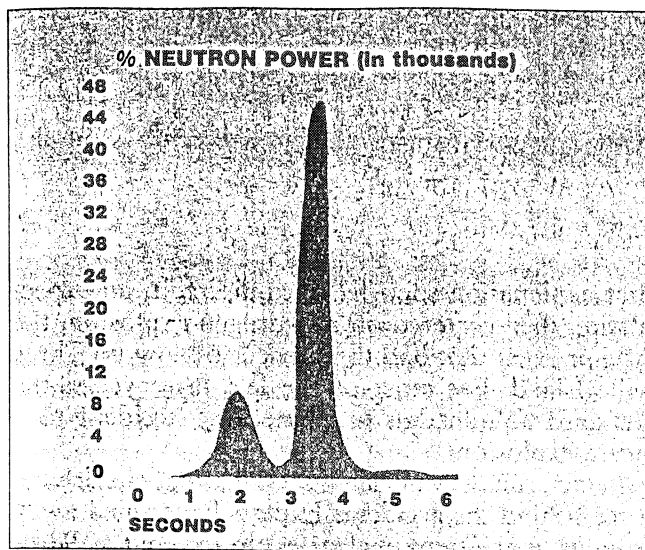
Zirconium to Stainless Steel Weld



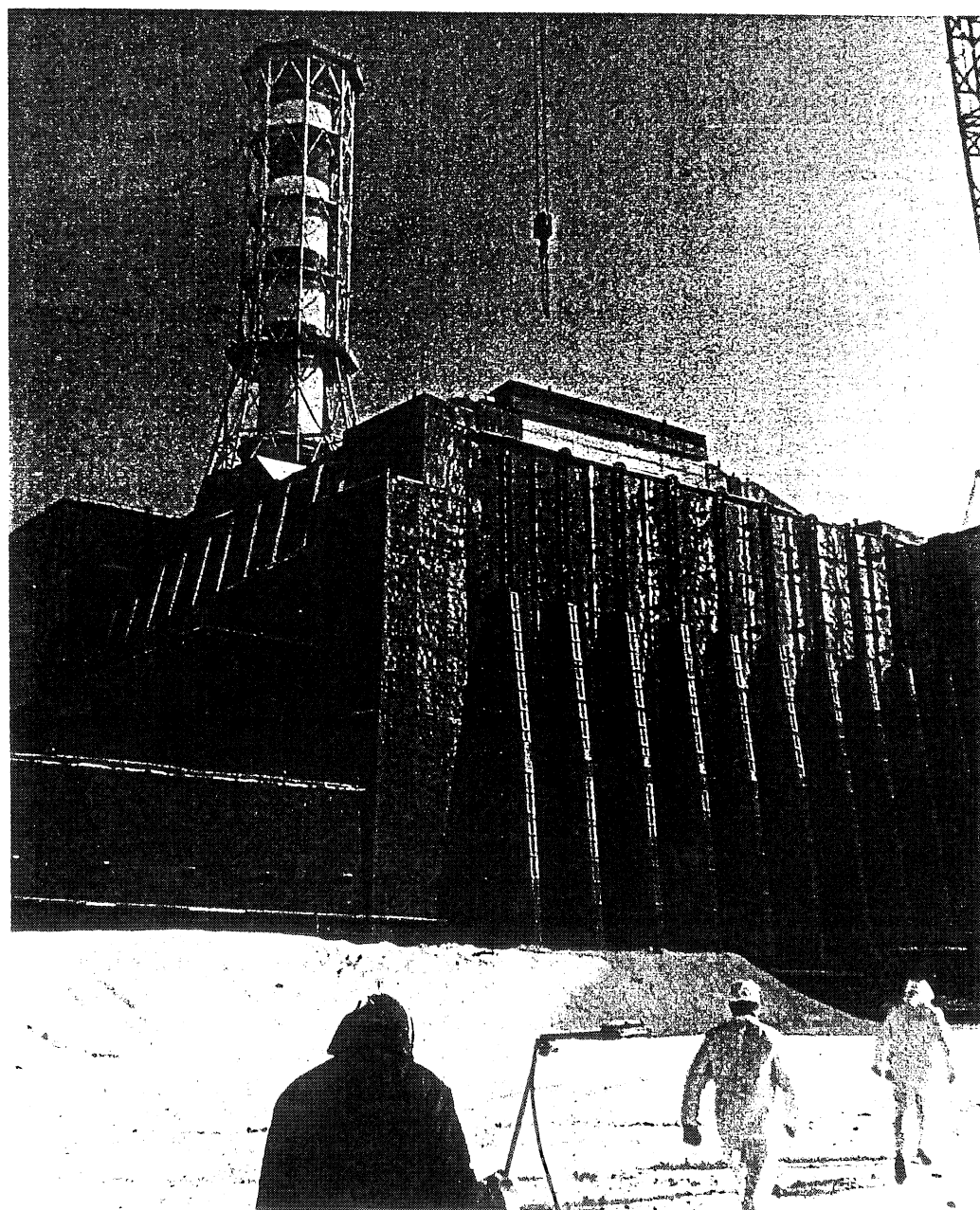
Fuel channel



Chernobyl-Type Reactor

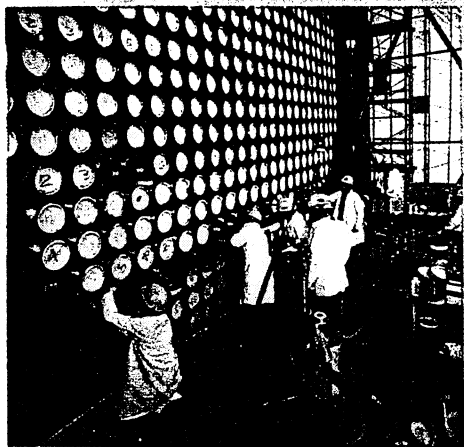


Left: Soviet calculations of Chernobyl Unit 4's behavior during the accident suggest that two explosions rocked the plant.



Left: While other RBMK reactors continue to operate in the Soviet Union, Chernobyl Unit 4, contaminated with radiation, will remain buried for centuries in a sarcophagus.

## Canada's Post-Chernobyl Challenge



Canada's CANDU plants are North America's closest operating relatives to the reactor that exploded at Chernobyl.

Of the nuclear power plants operating outside the Soviet Union, only Canada's CANDU reactors have a substantial positive-void coefficient—the design feature that rendered the Chernobyl reactor vulnerable to disaster.

Like the RBMK, the CANDU is fueled while operating, but the Canadian reactor is fueled horizontally so the rods don't penetrate the top, and the fueling mechanism is encased, like U.S. reactors, in a formidable containment structure. Moreover, the turbines are linked indirectly rather than directly to the reactor's cooling system, reducing the risk that pump problems could lead to an abrupt loss of water and bring the positive-void effect into play.

Official Canadian reports describe the CANDU's positive-void coefficient as about one-third that of the RBMK's. Specifically, the reports say that loss of coolant in a CANDU could increase reactivity by 7 to 11 mk (a measure of reactivity), compared to 30 mk in the RBMK. This distinction may be academic, since reactors become uncontrollable at about 5 mk.

More important, Ontario Hydro vice-president William Morrison says reactivity increases much more slowly in a CANDU and its control rods are much faster. Canadian licensing requires reactor designers to assume a worst-

case accident in which both coolant is lost and the primary shutdown system fails. Accordingly, all but four aging CANDUs have a second shutdown system that rapidly injects a fission poison into the reactor.

The Canadians point out that every reactor, whether or not it has a positive-void coefficient, is vulnerable to sudden changes in reactivity. For example, Morrison says that suddenly ejecting the control rods from a pressurized-water reactor (one type of water-moderated reactor) will speed up the reaction well beyond the point at which it would be uncontrollable. Zig Domaretski, safety chief at the Atomic Energy Board of Canada, says that every time a turbine disengages in another type of water-moderated reactor, reactivity rises about 10 to 12 mk. Dealing with this is straightforward, he says, requiring a shutdown system that reacts in the first half-second and provides 30 mk of damping within a few seconds.

"Every reactor has the potential for large reactivity increases, but only the RBMK did not recognize this adequately," according to Morrison. Domaretski says the RBMK's shutdown system is satisfactory only when the reactor is at full power, but accident analyses seem to have assumed full power—an "almost incredible attitude," he says. —William Sweet ■

that explanation soon fell into discredit, and speculation then centered on a hydrogen explosion, the type of event that had threatened to blow up Three Mile Island. For most of the last three years, the standard account has attributed the accident to a steam explosion.

In fact, runaway nuclear reactions were the driving force behind the accident. Experts have shied away from using the term nuclear explosion, but as Richard Wilson of Harvard University has said, "It was a nuclear explosion, there's no doubt, because the ultimate source of energy was nuclear. . . . To ever say it was not a nuclear explosion is just plain wrong."

First, a runaway reaction caused the fuel to melt and expand. Whether or not interactions with steam or water took place, the pressures would have sufficed to lift the lid. Once that happened and all the tubing ruptured, many conceivable catastrophes might have occurred, and for all we know, they all may have. Probably a second nuclear explosion occurred, much more violent than the first runaway reaction, and this nuclear explosion completed the destruction of the plant's physical structure.

Not every expert, to be sure, believes that the second explosion was nuclear. Brookhaven's Kouts, one of the most respected U.S. reactor specialists, thinks the second event was a particularly violent steam explosion caused by the sudden ejection of tiny fuel particles into the water-steam tubing. Other experts passionately reject this notion of a "superheat" steam explosion.

If the second explosion was indeed nuclear, would it be fair to say that the reactor blew up like an atomic bomb? In one sense, it would be deeply misleading to say that it did. While a bomb is designed to make a critical mass explode in microseconds with an energy measured in millions or billions of gigajoules, the Chernobyl reactor exploded thousands of times more slowly with an estimated energy of perhaps 1,000 gigajoules.

But if the second explosion *was* nuclear, it also would be deeply misleading to say that the plant did not blow up like an atomic bomb. In an explosion of that kind, the reactor would go through the same physical steps the core of a bomb traverses. It would turn into a critical mass and begin to react uncontrollably. The fuel would melt and finally vaporize.

Did the fuel definitely vaporize? The official reports sometimes waffle on this question regarding

*Punctuating concerns over Chernobyl is  
the suicide of the scientist delegated to preside  
over the official Soviet review.*

the first explosion, but they usually say that parts of the fuel must have become hot enough. If there was indeed a second nuclear explosion that was roughly 10 times more powerful than the first, there is no doubt at all: fuel would have vaporized.

### The Soviet Technical Fixes

When the Chernobyl accident occurred, 13 other RBMK reactors were operating in the Soviet Union, "many with fewer safety features than Chernobyl Unit 4 had," an NRC report observed. A number of other RBMKs were under construction, but their status is now uncertain because of spreading anti-nuclear activism, new concern about seismic dangers in the aftermath of the Armenian earthquake, and—not least—concerns arising from the Chernobyl accident itself. This April, the Soviets abandoned plans to build two new reactors at Chernobyl and announced that they would not expand similar facilities elsewhere.

The Soviets have introduced a number of design modifications to render the RBMKs less vulnerable to the type of accident thought to have destroyed Unit 4. They have slightly increased the enrichment of the fuel, installed stops limiting the extent fuel rods can be removed, and made the control-rod system faster. It is generally believed that operating RBMKs are being retrofitted to these specifications. Experts also suspect that the Soviets may be taking other measures to improve the RBMKs under construction, such as installing more pressure tubes and control rods to reduce the density of the graphite lattice.

The general intent of these measures is to reduce the scope and magnitude of the positive-void effect and enhance the control system's ability to cope with conditions that could lead to a runaway reaction. The consensus among Western experts is that the steps will reduce but not entirely eliminate the positive-void factor, and that they improve control of the rods.

But experts stress that there are strict inherent limits on the extent to which the RBMK can be made safer. And they express considerable concern that the corrective measures do not address all the severe accident possibilities that Chernobyl brought to light. Finally, some experts believe that the corrective measures may even aggravate some risks.

For example, the OECD report points out that

richer fuel increases the instability that exists when the fuel is first loaded into the reactor. The speedier control rods could cause still other serious problems. Each RBMK pressure tube has a sensitive weld toward the top and bottom, which joins an inner zirconium-alloy section to outer steel sections (*see the diagram on page 48*). The Soviets were well aware that these welds were vulnerable to sudden temperature changes, according to Kouts. He believes one reason the RBMK had a slow control system was to avoid subjecting the welds to excessive thermal shock.

If control rods were inserted suddenly, causing the temperature of the reactor to change abruptly, there is a serious danger that several of the tubes would rupture. A dozen or so breaks would easily suffice to lift the lid of the reactor, break the tubes and control mechanisms, and precipitate the chain of events that occurred the night of April 26.

In fact, Wilson and some other experts believe that a multiple tube rupture might have actually caused the Chernobyl accident. In this scenario, the accident may have resulted when the operators subjected the reactor to thermal shocks as they sought to stabilize it at a low power level. Whether or not this actually happened, it could have happened. Wilson says that he and others have tried to get the Soviets to focus on this scenario, but the Westerners have had little apparent success.

Because so many factors and combinations of factors could have caused or contributed to the catastrophe, Edward Purvis, who led DOE's study team, has criticized those who endorse a specific explanation. "If you're trying to make the RBMKs safe, you can't arbitrarily pick one thing and fix it," Purvis says. "You have to take care of all possible causes."

The NRC's view of the RBMK is not drastically different. Asked how he would rate the vulnerability of the modified RBMK to catastrophic accident, Harold Denton, the former NRC safety chief, said, "We wouldn't license such a reactor here, and we've told them so."

Soviet authorities have tried to blame the Chernobyl accident primarily on the plant's operators, and the top people responsible for running the plant have been tried and convicted of negligence. But years before the accident, British reactor experts are reported to have told their Soviet counterparts that the flawed RBMK design put excessive demands on the plant operators. It is an open question whether

*The top of the reactor is relatively  
defenseless in all the Soviet units  
built or under construction.*

the modified design represents a significant and adequate improvement.

### Meltdowns and Explosions

Chernobyl has implications primarily for the RBMK reactor and secondarily for Soviet management of nuclear energy. U.S. reactors, in which water as opposed to graphite moderates the reaction, are not seriously vulnerable to a Chernobyl-style mishap. A fizzling steam explosion could occur in a U.S. reactor if a molten core dropped into a pool of water, but the possibility is remote, and the result would not be the enormously violent nuclear explosion that destroyed Unit 4.

While the Soviet government has made an unprecedented disclosure of sensitive information, and has displayed an extraordinary willingness to take advice from outsiders, reactor experts in the United States and Canada remain worried about the possible recurrence of a catastrophe in an RBMK reactor. These scientists are unhappy about the reluctance of the Soviets to perform the very detailed accident analyses that came into fashion here after Three Mile Island. And despite the openness to Western criticisms, government censors still routinely excise Chernobyl-related articles from Western publications circulating in the Soviet Union.

Punctuating the continuing concern over RBMK reactors is the suicide of Valery Legasov, the atomic scientist the Soviets had delegated to preside over the official Chernobyl review. He killed himself on April 27, 1988, the second anniversary of the accident, and official explanations of the death are vague. Reliable private reports indicate he had a terminal disease and planned his death in collaboration with a physician, but it is possible that Legasov, by choosing the day he did, also wished to make a public statement with his death.

Certainly it gives weight to his posthumous warnings about the threats that Chernobyl still poses. A month after the suicide, *Pravda* published parts of memoirs that Legasov had dictated into a recorder during the two years after the accident. *Pravda* headlined the excerpts, "It is my duty to speak out."

According to the extracts, Legasov had been aware of deteriorating trends in the design and management of nuclear power plants before the accident, but he had felt powerless to intervene because "professionals in the field did not take kindly to

outside interference." The scientist complained that officials had dismissed his calls for rigorous reactor fault analysis and studies of safer reactor types.

While he felt nuclear power plants probably were safer than conventional power plants, Legasov worried about the amount of graphite, zirconium, and water in the RBMK. And he was concerned about the lack of safety systems that would activate independently of operators.

Legasov came to believe that an important underlying cause of the disaster was the absence of individual responsibility for equipment quality. He called the events at Chernobyl the "apotheosis and peak of the economic mismanagement in our country over decades."

Just before his death Legasov told *Pravda*, "The lessons of Chernobyl have still not been analyzed to the end." ■

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## DECLARATION OF CHRIS MOHR

Chris Mohr deposes and says:

(1) My name is Chris Mohr. My home address is 655 Natoma Street, Apartment C, San Francisco, CA 94103.

(2) I work at Tenderloin Neighborhood Development Corp., as the Director of Fund Development. My business address is 201 Eddy Street, San Francisco, CA 94102. I have worked here since April 1995.

(3) I began working at *Physics Today* in or around February 1991 as an assistant editor. I left *Physics Today* in August 1993 to pursue an internship at a non-profit anti-poverty organization.

(4) My immediate supervisors were Barbara Levi, Gloria Lubkin, and Kenneth McNaughton. Terry Braun was the Director of Human Resources.

(5) While at *Physics Today*, I was responsible for editing the "We Hear That. ." portion of the magazine which consisted mainly of articles about awards and obituaries. Usually, I edited about 5-10 obituaries per month and wrote 1-3 awards' articles per month. I also edited the calendar section of the magazine and copy-edited one to two feature articles per month.

(6) While at *Physics Today*, I wrote some pieces for small magazines, notably *Lies of Our Times* (now defunct). That magazine published one long piece detailing scientists' participation in the Gulf War ("The Gulf War and the Technologists," March 1992), as well as several shorter items. On this article, I spent upwards of 20 hours working on the article, of which at least 15 hours was spent at work. On other pieces I wrote while at *Physics Today*, I would generally write 80% of the article at work, and 20% at home. I did all the writing on my computer at work and read all the source material while at work

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because it was based on the scientific magazines and publications received by *Physics Today*. I did this openly and spoke with co-workers about the article. No one ever said anything about my working on this piece.

(7) I also contributed to the monthly newsletter of my religious congregation. This usually consisted of synthesizing different e-mails from a monthly alert group into a short article. I also openly did this work during normal working hours at *Physics Today*.

(8) It was my understanding that AIP, as an institution, encouraged the practice of its employees doing outside writing. The Institute's history department published books of employees which were understood to have been written on company time. To my knowledge the Institute never had a policy against its employees pursuing and publishing writings outside the Institute, and doing such work on company time.

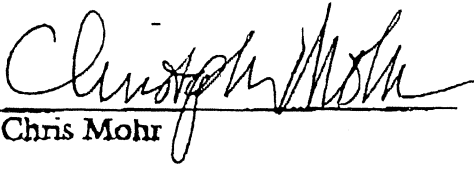
(9) In general, if I completed my responsibilities in a timely way, I was not given additional work to fill my time.



VERIFICATION

I hereby verify under penalty of perjury pursuant to 28 U.S.C. § 1746(2) that the statements contained therein are true and correct to the best of my knowledge, information and belief.

Executed on March 15, 2001.

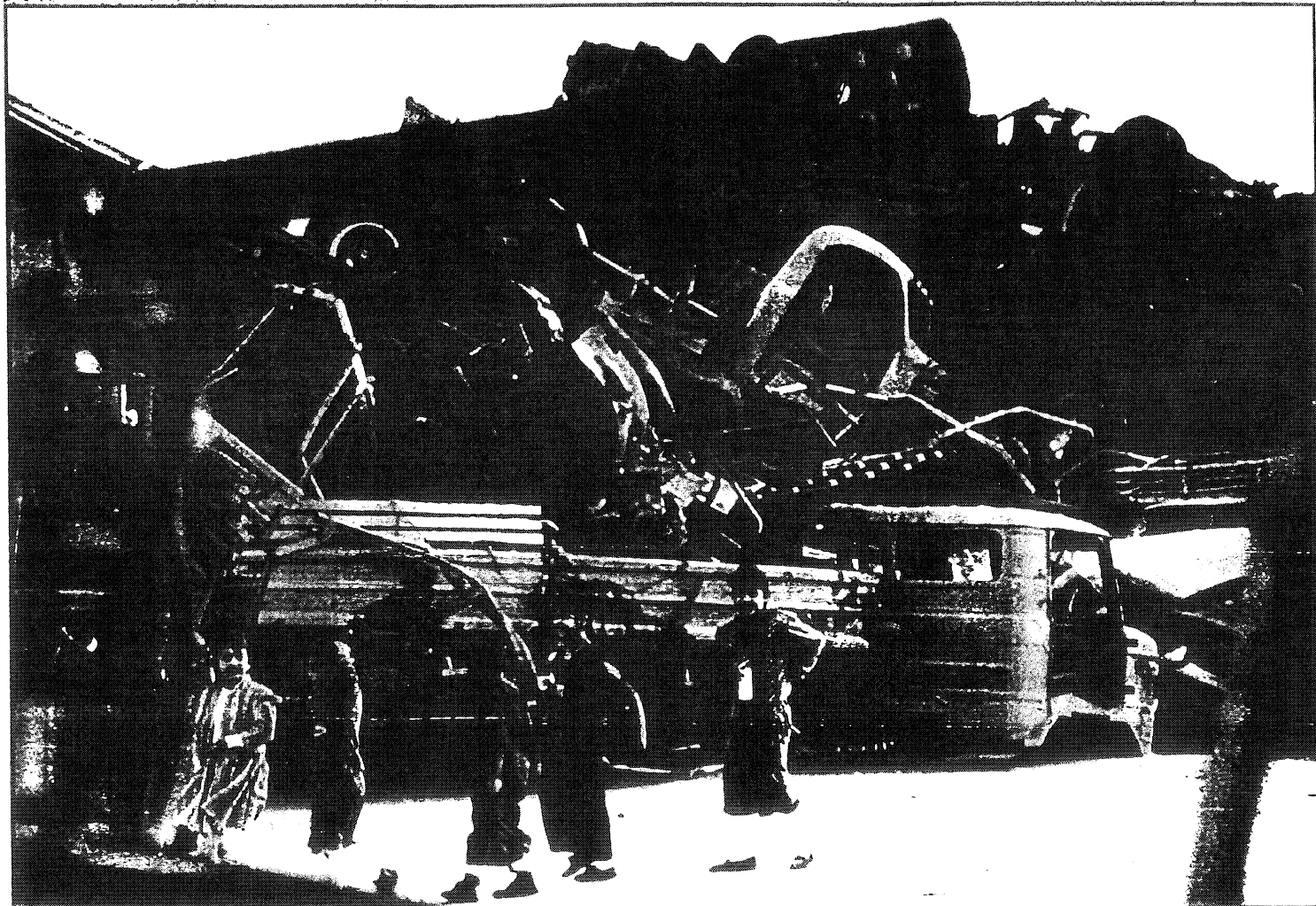
  
Chris Mohr

# Lies Of Our Times

MARCH 1992

A MAGAZINE TO CORRECT THE RECORD

Subscription to 2015 \$3.00



## Souvenir Hunting on the "Highway of Death"

The Gulf War One Year Later

Sexism at the Times

Cuba, Salvador,  
Rally for Peace

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Cover: Kuwaiti children walk along "the highway of death." The area, according to the AP caption, is "frequently visited by tourists and locals looking for souvenirs." AP / Wide World Photos.

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**D**ue to an error in the binding of copies of the last issue of *LOOT* (January-February 1992), a large number of copies were bound with a sharply creased cover, causing many to come apart in mailing.

Many subscribers received nothing but the last page of the magazine in their mailboxes; some received nothing.

If you were one of these and have not yet notified us, please call or write and we will ship you a new copy of the issue at once. We apologize for this inconvenience.

We also apologize for the delay in the production and delivery of this March issue. As you may notice, we have commenced using new hardware and software, producing, we think, a clearer, easier-to-read magazine. We hope you continue to enjoy reading *LOOT*.

## Lies Of Our Times

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## To Our Readers

*Lies Of Our Times* is a magazine of  
media criticism. "Our Times" are the  
times we live in but also the words of the  
*New York Times*, the most cited news  
medium in the U.S., our paper of record.  
Our "Lies" are more than literal false-  
hoods; they encompass subjects that  
have been ignored, hypocrisies, mis-  
leading emphases, and hidden prem-  
ises—the biases that systematically  
shape reporting. We can address only a  
sampling of the universe of media lies  
and distortions. But we hope *LOOT* will  
go a long way toward correcting the  
record.

# The Gulf War And the Technologists

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Chris Mohr

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A year after the Gulf War, the technical community that designed and built the weapons of Desert Storm has assessed the performance of their products and concluded that, despite a few flaws, the weapons worked quite well. The evaluations in the professional literature reveal much about the technical culture in the U.S. as well as about the weapons themselves.

Common to these evaluations in engineering, physics and aerospace industry publications is an unquestioning acceptance of U.S. government policy toward Iraq. When policy is mentioned at all, it is solely in the official terms dictated by the government: Kuwait was to be liberated, Saudi Arabia protected, (American) lives saved, and so on. In the literature the war is treated as a technical problem to be solved with the application of weapons technology. In such a context, moral and political questions are irrelevant. The only questions askable involve technology: Did the weapons work? How well? What were their flaws?

## A Special Report

One of these journals is *Spectrum*, whose September 1991 issue was a special report, "Gulf Legacy: War as a Test Lab." *Spectrum* is published monthly by the Institute for Electrical and Electronics Engineers (IEEE), primarily for its members, and has a circulation of more than 300,000. With many contributors from the military and military contractors, the special issue shows the culture in which IEEE assumes its readers will feel comfortable. And no wonder: Some 60 percent of federally funded basic R&D is supported by the Pentagon, according to a 1991 National Science Foundation report. And some one-third of all scientists and engineers in this country outside of biomedical fields work on defense projects, according to a September 1991 study by the Carnegie Commission on Science, Technology and Government. For example, the Georgia Tech Research Institute is funded primarily by the military. According to GTRI's 1991 annual report, the U.S. Air Force provided 29 percent of its funding, the Army 24 percent, the Navy 4 percent, and other defense agencies 25 percent—or 82 percent overall. Such is the technical culture in the U.S., as *Spectrum* well knows.

The special issue of *Spectrum* has a great deal more interesting material than can be noted here. However, the IEEE's attitude is best shown by the issue's editors, John A. Adam and Glenn Zorpette, both on staff at *Spectrum*, in their introductory essay: "Differences in leadership and morale counted heavily, but first and foremost was the force of western technological might—before and during the war." That the sheer amount and intensity of

western bombing was unprecedented they did not mention. Along the same lines, in an essay entitled "Technology: The edge in warfare," Norman R. Augustine said, "U.S. forces used technology to overcome numerical disadvantages in manpower and material, and to minimize the loss of life among U.S. and allied forces." He warned against cuts in funding for weapons now in development and alerted readers to what he calls "near-fatal obstacles in our hardware acquisition process," which delayed the Patriot missile. Augustine's position is unsurprising, since he is the chairman and CEO of Martin Marietta Corp., which, as he points out, assembles the Patriot under a contract with Raytheon.

Other technologies were less heralded than the Patriot during the war, but were clearly more significant. A new airborne radar system, the Joint Surveillance Target Attack Radar System (Joint Stars), was deployed to track ground targets. As several contributors point out, the Stealth fighter-bombers flew only with support from radar-jamming EF-11s flying behind, so stealthiness is still not fully proven on its own. And Major Tim Gibson, a computer science instructor at West Point, describes the four computerized command and communications networks set up and linked together in the desert. Hundreds of satellite dishes were deployed: within three months the number of users grew from 18 to more than 80.

In perhaps the magazine's most startling essay, Janet Morris, the "research director for nonlethality" at the U.S. Global Strategy Council in Washington, D.C., and a consultant to Lawrence Livermore National Laboratory, where nuclear and other weapons are designed, advocated a new destructive technology called nonlethal weaponry. As a good member of the technical culture, she failed to question why the military needs such technologies. Instead she sold the merits of what could be called New Age weapons. "Technology now offers such options, and they are life-conserving, environmentally friendly, and fiscally responsible," she said. Others would disagree; such weapons could include jellied superacids "potentially millions of times more potent than hydrochloric acid," and polymer agents to choke engines or glue weapons. Apparently such agents would be dumped on tanks or trucks only when their drivers are in the mess hall, where they will not be burned, choked, or glued themselves.

## Some Other Examples

*Optics and Photonics*, the membership journal of the Optical Society of America, confined its attention to a single narrower topic in its war review, the cover story of the November 1991 issue entitled "Electro-Optics in Desert Storm." Electro-optic devices used in the Gulf War provided identification of friend or foe, night vision and other surveillance abilities, obstacle avoidance for low-flying helicopters, and chemical agent detection. The article's three authors, B.D. Guenther, R. Buser, and W. Morrow, work for various labs run by the Army, and they explicitly identify with the military: "The success of the Coalition's electro-optic systems demonstrated the need to preserve our technological lead. The problems encountered uncovered the need for future development of improved electro-optic capability to support our distinguished military forces." By publishing such pieces, the Optical Society becomes an advocate for the military rather than simply a neutral professional organization.

The October 21, 1991, issue of *Aviation Week and Space*

---

Chris Mohr is a writer and editor in New York City.

*Technology* featured 29 articles on the cover topic, "Mixed Signals for Electronic Warfare." *Aviation Week*, published by McGraw-Hill for aerospace industry professionals and other interested readers, features military topics as part of its regular coverage, so this issue is not especially unusual.

And the writers, who are employees of the magazine and not the military, aim to give a fair assessment of "electronic warfare," including past failures, recent successes, and possible future cutbacks. Still, the lead essay by the issue's editor, contributing avionics editor Philip J. Klass, is positive about the war: "The recent Persian Gulf conflict served as a showcase to demonstrate the effectiveness of a variety of electronic warfare techniques developed since tactical aircraft first encountered Soviet radar-guided missiles 25 years ago in Vietnam." Notice that Klass describes a conflict between weapons, not a war fought by people.

Of the professional magazines I surveyed, only one, *Technology Review*, attempted to look at some of the larger questions



U.S. soldiers surround Iraqi who surrendered because, the AP caption said, "he feared the Kuwaiti army.... The Americans turned him over to the Kuwaitis...."

absent from the others. *TR* is published by the MIT alumni association. The May/June 1991 issue featured a lengthy article by Michael T. Klare, an associate professor at Hampshire College and the director of the Five-College Program in Peace and

## Tourists as Targets

In "Tourists, the Peacetime Target of a Shipful of Military Magic" by Douglas Martin (*New York Times*, January 10, p. C1), the entire space above the fold of the "Weekend" section's front page was taken up by a picture of planes and tourists on the deck of the Intrepid Sea-Air-Space Museum, the war museum on the old aircraft carrier in the Hudson River.

The article's tone was breezy: Martin wrote that a submarine "is only one of tons and tons of military attractions at the Intrepid," and gushed, "There is so *much* to see [his emphasis]." He parenthetically considered the two cannons aimed at midtown Manhattan as "not necessarily a bad idea." Following his example, the reader could conclude that weapons are to be giggled at, what with "the cold war rapidly becoming a piece of nostalgia," as he phrased it.

Martin must not read the paper's front section. He failed to connect the presence on the Intrepid of parts of the types of missiles used "to punish Iraq" with the ongoing wars in the world and the continuing militarism of the U.S. government.

In case the reader still had not understood, near the end of the article Martin wrote, "But go see for yourself, particularly if the unexpected boredom of peace are weighing a tad heavily. The Intrepid takes you back to boom-boom. John

Wayne, and simple values that, when all is said and done, have kept the United States alive and kicking like a colt for almost 216 years." Perhaps this was meant ironically, but it is more likely simple grandstanding and cheerleading for the U.S., as well as a lament for the simpler days of the Cold War, before all this boring peace broke out.

Not all of us see the Intrepid so giddily.

During the Military Book Fair held on the Intrepid May 31, 1991, a group of Quakers from Manhattan staged a vigil for peace there, holding signs with slogans such as "Publish for peace or perish by war." For four hours under a blazing sun, we stood as busloads of children and handfuls of editors and writers passed by. The security guards asked us several times to move, but they never called the police despite threatening to do so. A German couple—the sort of tourists the headline was aimed at—had seen the shiny planes on deck from afar and wanted to go aboard for a closer look. Our presence deterred them, though, as they were really for peace, and they left without going in.

Martin's article says quite a lot about how the *Times* would have us view the world, even in our own backyard. An article on a local tourist attraction becomes an occasion to gloat about how this country acted to "punish Iraq," to suggest that peace is here and it's boring (both questionable assertions), and to celebrate John Wayne and militarism.

—C.M.

World Security Studies, on evolving military strategy in the wake of the Gulf War. Primarily he details the military's current doctrine, called "mid-intensity conflict" to distinguish it from "low-intensity conflict" of Central American and African wars and "high-intensity combat" of all-out war.

Klare wrote, "Like Desert Storm, future mid-intensity conflicts are likely to be rapid-paced and high-tech, entailing unrestrained use of the most sophisticated weapons. In essence, the United States will fight rising Third World powers by wielding weapons designed for war with the Soviet Union." By critiquing policy, Klare violates the rules of technical culture, but he is not in fact a technologist.

### The Humane Engineer

In the July 1991 issue, *TR* did, however, carry an essay called "Engineers and the Nintendo War" in the column "The Humane Engineer." Its author, Samuel C. Florman, a writer of several books including *The Civilized Engineer*, said,

Operation Desert Storm differed from previous wars by revealing in our society a heightened concern for individual human lives. How striking it was that President Bush, General Schwarzkopf, and other political and military leaders shied away from talk of killing. There was not only an unprecedented effort to minimize the casualties—at least among the allies—but also a studied determination to avoid discussing them. There was death and suffering aplenty, but, perhaps for the first time in the history of war, nobody wanted to talk about body counts.... Our leaders carefully crafted their Desert Storm pronouncements to reflect the concerns of a citizenry that wanted war but not bloodshed.

With all due respect to Florman, the past does provide examples of regimes that avoided talk of body counts. Such government behavior is usually called propaganda and covering up, but Florman apparently cannot believe that of his leaders. Fortunately, *TR* published a letter by Joel Weisberg, a physicist at Carleton College, in the November issue that corrected the record: "That this slaughter was barely mentioned in the media amidst the heroic chest-thumping shows how little value we place on human lives," Weisberg wrote.

*TR* also printed a lengthy interview on the U.S. space program with Martin Marietta's Augustine in the August/September 1991 issue. Here it said, "Probably no other aerospace executive commands such respect from diverse quarters." So despite its greater openness, even *TR* maintains its respect for the defense establishment.

### Conclusion

This survey illustrates the way the technical culture works to evaluate problems on the terms dictated to its members by their employers. Perhaps the culture could change for the better if we managed to get the technologists to think more about the policies that drive their work. Then perhaps some of them would refuse to use their creative, technical talents for the pursuit of lopsided wars, and fewer of them might contribute to the system's propaganda. •

## Sins of Omission

### The Ustica Affair

On June 12, 1980, an Italian civilian airliner crashed at Ustica, Sicily, as it neared Palermo, killing all 81 persons aboard. Since that time there has been debate in Italy about the circumstances of the disaster, a widely held view being that the plane was shot down and that there has been an official cover-up of the facts. One further hypothesis, discussed for years and supported by evidence (see Flaminia Cardini, ed., *Ustica: la via dell'ombra*. Sapere due mila, 1990), is that the downing occurred as a result of miscalculations in an attempt by Free World forces to assassinate Libyan leader Muammar Qaddafi, who was scheduled to fly on an airliner in the close vicinity of the destroyed Italian plane. (A Libyan MIG was shot down in the course of the same incident.)

With an Italian film on the crash and its coverup ("*Il Muro di Gomma*," or "The Rubber Wall") now receiving substantial publicity in Rome, the *New York Times* finally deigned to recognize the event (Alan Cowell, "Italian Obsession: Was Airliner Shot Down?" February 10, 1992, p. A7). Several elements of the *Times* rendition of the story are notable. First, the issue is categorized as an "obsession," which puts it in the class of the irrational (in contrast with U.S. "concern" over Libyan "terrorism," etc.). Second, the cover-up is described as "purported," although the *Times* account does go on to note that "successive inquiries" have charged a coverup and that investigating magistrate Rosario Priore warned air force officials in January that they face charges of treason and obstructing justice if they continue to fail to supply information.

The third point of interest is that nowhere does Cowell or the *Times* mention the hypothesis that this tragic error may have been a result of an attempt to murder Qaddafi. Accusations against Qaddafi are reported freely in the *Times*, but an attempt to kill him by the United States and its allies may be reported only when admitted by the western authorities themselves.

—Edward S. Herman

### Fear of Terrorism or "Anti-Terrorism"?

In April 1991, following four political assassinations within a month, the Aylwin government of Chile announced plans to form an "anti-terrorism" unit. As reported in the *New York Times*, the important news associated with this announcement was the assassination of rightwing Senator Jaime Guzman and his funeral, attended by Aylwin and Pinochet; the "outcry against terrorism"; and the question of whether the government would have the will to fight terrorism. The article closes with a long quote by a Guzman associate doubting "that the government is capable of handling terrorism" (Nathaniel Nash, "Chileans Plan Anti-Terror Drive," April 5, 1991, p. A6).

In the *Financial Times*, an entirely different focus is evident in the title of their article: "Chilean fears over anti-terrorist unit" (Leslie Crawford, April 16, 1991, p. 6). It features the pressure of Pinochet and the army, "lobbying hard to be included in a new



## MARLOWE HOOD

U.S. must block  
Khmer Rouge bid

**D**ESPITE CLAIMS of having backed away from diplomatic support of the Khmer Rouge, the United States government is persisting in an old Cold War policy that benefits the still-powerful remnants of Pol Pot's genocidal regime. Last July, the Bush administration withdrew recognition of Cambodia's U.N. seat, ostensibly because it was occupied by a coalition that includes the Khmer Rouge.

Since then, however, the United States has not only backed a U.N.-sponsored "comprehensive political settlement" that would give the Khmer Rouge equal status in a transition government, it has helped to block amendments to the U.N. plan designed to prevent their return to power.

Pol Pot inaugurated his deadly regime on April 17, 1975. By the time Vietnam routed him 44 months later, the Khmer Rouge had dispatched 15 percent of Cambodia's population — a million people.

The architects of this unparalleled criminal achievement should, as Nobel Peace Laureate Elie Wiesel has suggested, be tried in the International Court of Law for crimes against humanity. But inviting Pol Pot's associates into a reconciliation government is not only a moral outrage. It is a decisive step toward renewed disaster.

Of the two reasons usually advanced for including the Khmer Rouge in the tripartite Cambodian resistance and the U.N. settlement, one is obsolete and the other unconvincing.

**I**T IS TRUE that Pol Pot's army has been the only indigenous force capable of pressuring Hanoi to withdraw its army. Coalition partner Norodom Sihanouk, who ruled Cambodia from 1954-70, has prestige but little muscle. The third member, former Prime Minister Son Sann, has neither.

But since Vietnam pulled its soldiers out, and the Phnom Penh regime of Prime Minister Hun Sen agreed in principle to U.N.-supervised free elections, the Khmer Rouge has become simply an instrument of torture.

Asserting that the Khmer Rouge will be easier to control inside a transitional leadership body misses the point. As long as China is allowed to send cash and arms — most recently tanks — the Khmer Rouge will continue to cause trouble. Are we to trust China and its client to respect election results and adhere to U.N. proposals that would ban external support and require laying down arms? China has strong incentives to maintain the status quo. Khmer Rouge defectors and confiscated documents leave no doubt that Pol Pot is still in charge, his ideology intact.

Cambodia's only chance for peace must begin with the dismantling of Pol Pot's monster through a total international embargo.

Only the United States has the

clout to pressure China to abandon its hideous proxy. But Washington has scuttled every initiative to forge a solution that not only prevents Vietnam from interfering with elections, but isolates the Khmer Rouge as well. The State Department rebuffed recent pleas by Sihanouk to back him if he breaks from the Khmer Rouge, and it rejected a Japanese proposal last month calling for the formation of an international committee to investigate Khmer Rouge crimes during their rule, and for an immediate cease-fire.

**A**S IT STANDS, the U.N. draft agreement refers vaguely to the "non-return of the policies and practices of the past," and postpones a cease-fire until after the document is ratified. That has led to intensified fighting.

Vietnam and the Hun Sen regime are desperate enough to join the developing world to risk a Nicaraguan outcome to supervised elections, but have justifiably balked at the U.N. settlement being foisted upon them.

At a negotiating session next month, Hun Sen will press for strong measures for disarming the Khmer Rouge and a specific provision preventing their return to power.

There is still time for the United States to do the right thing, and act to isolate, rather than accommodate, the Khmer Rouge. Only then will what Sihanouk has called "the most unfortunate, the most unhappy and the most humiliated people in the world" know that the killing fields are gone forever.

*Marlowe Hood is co-editor of "The Cambodian Agony" and a visiting scholar at Columbia University's East Asian Institute.*



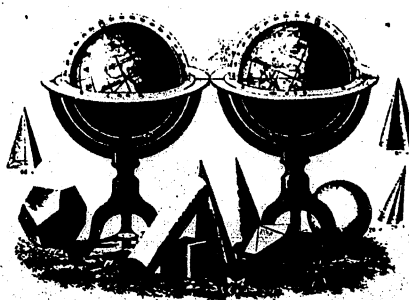
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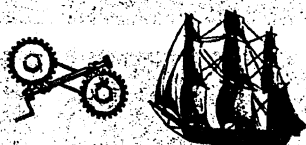


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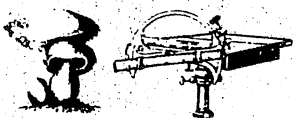
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# Science Books For General Readers

**A new breed of writers with new attitudes  
has broadened the potential audience**

**By Alexander Hellemans**

Besides the great mathematicians, theoreticians, discoverers and inventors, the history of science is rich in a special group of people: the authors of great science books. Most of them do not have theories or theorems to their name, but have been, and are, skillful writers who could attract large numbers of readers by explaining scientific matters in an approachable way.

Some have been simultaneously great scientific thinkers and wonderful writers. Darwin's book, *On the Origin of Species*, for instance, was of primary importance scientifically, but was also perfectly accessible to the educated layperson. The biologist T. H. Huxley, known for his debate with Bishop Wilberforce on Darwin's theories, contributed enormously to the understanding of science by his popular writings. In this century, several distinguished scientists have devoted themselves to bringing science to the public: Robert Bell, Arthur Stanley Eddington and James Jeans among the astronomers, and Peter Medawar, George Gaylord Simpson, Julian Huxley and René Dubos among the biologists—all of them great science writers. And many essayists, philosophers and novelists have tried their hand, often successfully, at science writing: H. G. Wells, Bertrand Russell, Arthur Koestler, John McPhee and Lewis Thomas are names that spring to mind immediately.

But all this notwithstanding, scientific books for a general audience have always occupied a somewhat ambiguous place in publishing. Such books, termed (usually by academics) "scientific popularizations," or worse, "scientific vulgarizations," have often been considered minor products by both scientific and humanist intellectuals.

In fact, scientists writing for a gener-

al public often experience disapproval from their colleagues. Margaret Mead's difficulty in finding acceptance of her ideas among her peers after the publication of her popular *Coming of Age in Samoa* is a well-known example. Rae Goodell, in her book *The Visible Scientists*, relates that Mead once told her that her colleagues, encountering her at meetings, would say things like: "Oh, my wife is interested in your articles; she reads them at the hairdresser."

There is no doubt that writing for a general public can interfere with a scientific career. Robert Jastrow, who teaches science at Dartmouth and is author of *The Enchanted Loom: The Mind in the Universe*, among many other books, finds that "it is a problem you have if you are an assistant professor trying to get tenure." Notes Stephen Jay Gould, author of *Ever Since Darwin: Reflections on Natural History* and *The Mismeasure of Man*, "It is a cross that everybody who writes for the public has to bear, but I don't think it is much more than jealousy." Allan Lightman, author of *Time Travel* and *Papa Joe's Pipe*, is optimistic at this point: "At the moment, a whiff of illegitimacy clings to scientists turned writers. I believe that as more respectable scientists, such as Stephen Gould,

Carl Sagan, Steven Weinberg and Freeman Dyson, turn their hand to writing, such activities may become more accepted in the scientific community as useful ways for scientists to spend part of their time."

On the other hand, there was, and probably still is, a cultural bias against science on the part of a large segment of the reading public. The late C. P. Snow, in his famous 1959 Reid Lecture on the "two cultures" recalled how the distinguished Cambridge mathematician G. H. Hardy remarked to him in the 1930s: "Have you noticed how the word 'intellectual' is used nowadays? There seems to be a new definition, which certainly doesn't include Rutherford or Eddington or Dirac or Adrian or me. It does seem rather odd, don't you know?"

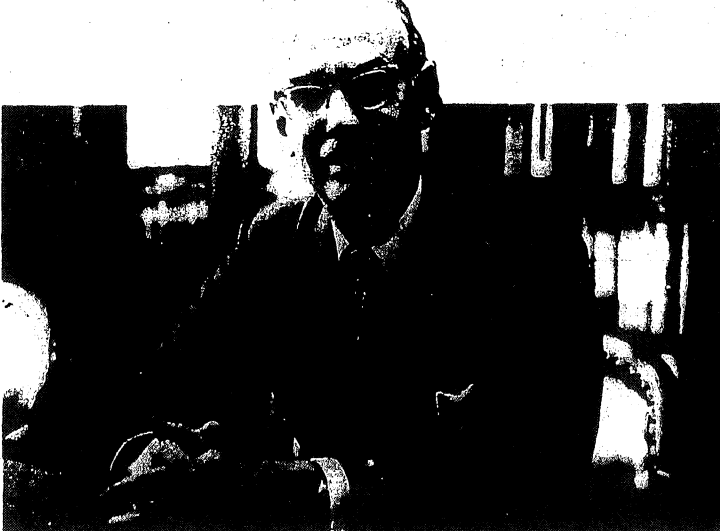
Most of the publishers and science writers talked to recently agreed that there has been an increase of inter-

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**Charles Scribner**



by Alexander Hellemans

*Hellemans is an editor at Physics Today, the publication of the American Association of Physicists, and an occasional contributor to PW.*



est in science among the general public during the last few years. The science programs on television have been instrumental in heightening this interest. "There has clearly been a quantum jump in science," says Paul Wehn, marketing manager at Cambridge University Press. "This is reflected in the appearance of all those new science magazines." Jastrow sees another factor contributing to this interest: "Science is connected with prosperity in the eyes of today's young entrepreneurs, who associate productivity with high technology and invention."

Although the public is now more critical about scientific matters than in the past, the period of disenchantment with science of the late '60s and the '70s seems to have abated. It is certain that one of the consequences of the much-publicized discussions about the possible dangers of gene splicing made the public more interested in the new field of molecular biology. More recently, the debates around creationism have inspired a series of books on Darwinism and evolution.

But not only scientific controversies have kept science in the attention of a general public. An impressive series of scientific discoveries in recent decades resulted in books that reached a wider audience. One of the best known examples is *The Double Helix* by James Watson, an account of the discovery of the structure of DNA, the molecules that carry the genetic information in every living being. According to Edwin Barber, v-p at Norton, Watson's book "was a fortunate and shrewd marriage of science and personality; it sort of demystified science." Watson's book was also the prototype of a new kind of science writing, showing the human side of scientific research. "Books like *The Soul of a New Machine* by Tracy Kidder were almost substitutes for biography," says Patrick Filley, v-p and editorial director at Doubleday.

Probably one of the reasons for the currently more sympathetic attitude of the public towards science is a subtle philosophical shift among science writers themselves. "Science writing has generally greatly improved in quality and in philosophical awareness," says Jacques Barzun, literary critic and author of a quite negative study of the scientific establishment, *Science, the Glorious Entertainment*, published in 1963. "Science writing is not so brash and full of self-consciousness and untenable claims as it used to be," adds Barzun. "Writers about science are now expressing both the tentative character of science and the role of interest and perspective in scientific work itself. The old absolutism, what science says is thus and so, this aspect has been broken down—or at least attenuated."

This change in science writing is, ac-

cording to Barzun, the result of a "humanization" of science. "My writing has been influenced as much by nonscientific as by scientific writing," says Allan Lightman. "My favorite form is the essay, and the greatest American essayist, in my opinion, is E. B. White." "There is a whole generation of young scientists who don't see barriers between the two cultures," says Edwin Barber. "They are in their 20s and 30s and are going to be interested in writing for the general public."

"Science, in my view, is a part of our culture, in the humanist sense of the word 'culture,' that part of our heritage on which Western man builds an identity," says Robert March, a high-energy physicist at Wisconsin University and author of *Physics for Poets*. "One of the worst events in the history of science was when the phrase 'natural philosophy,' to refer to science, was dropped," said Charles Scribner Jr. "If you look at the great steps in the development of science—the theory of quantum, relativity, the Grand Unified Theories—you see that the individuals who overcame difficulties in these areas acted in an imaginative, humanistic and philosophical spirit. Einstein's critique of the idea of simultaneity was a philosophical argument."

As an example for his view of science as part of the humanities, Scribner recounts how, while reading Proust recently, he discovered that *Recherche du Temps Perdu* is filled with science. "Proust used magnetism or supersaturation as the basis of striking metaphor."

### New Directions

Not only have scientists' own interests altered, but the ways in which they address the public have changed, too: "I see a growing tendency not to write down to the reader," remarks Scribner. Barzun notes that some 20 years ago "it was difficult to find a good work of popularization in science that was not talking down to babies." The science writers agree: "I don't see at all why writing for the general public should debase the richness of any idea," observes Stephen Gould.

Darwin's great work, published in 1859, was perfectly accessible to the lay reader of the time. But today many new scientific theories are perforce often out of the reach of the layperson, and many fear that the gap between scientific knowledge and what the public can follow is widening every day. Robert March, however, disagrees with the view that the complexity of science is increasing: "What has happened is that the specialization of science is increasing. There are more scientists, and they are inquiring into more details. But the general principles on which science

works, the ideas that are currently at the forefront of science, are in many ways simplified. In my own area of research, particle physics, I think you can now explain it at a level of fundamental theory to the layman. You couldn't do this 15 years ago." Allan Lightman is of the same opinion: "I believe there is no concept in science too difficult to convey to the public. A firm grasp of the subject allows the writer to simplify without giving up accuracy, honesty or respect for the reader." And Lightman adds: "In this regard, a science writer who is not also a scientist is at a disadvantage."

### The Science Writer's Craft

Both scientists and professional science writers have their own problems in dealing with writing for a general public. March believes that science books will command a larger portion of the market if "scientists learn to write better and professional writers improve their knowledge of science. I am very much encouraged by the science journalism I see these days," he adds. "Our science reporters are improving in quality, and when they get a vehicle like a book, they do a marvelous job."

**"Science is connected with prosperity in the eyes of today's young entrepreneurs."**



Robert Jastrow

Scientists, according to Jastrow, have to perfect their craft "to eliminate the jargon, the unexpressed knowledge and assumptions that lie in the background." Jake Goldberg, an editor at Crown, says that when evaluating a manuscript, he pretends "to be a layman, even if I know a little more about the subject." Charles Scribner, who is convinced that the best science writers are found among working scientists, quotes the 19th century American thermodynamicist Josiah Gibbs to describe the skill of the science writer: "The purpose of theoretical research in every field of knowledge is to find the point of view from which the subject appears in its greatest simplicity." And Scribner continues: "It is to find the simplest way of looking at things, and a good science writer not only has to do that as a scientist, but also as a writer."

Edwin Barber: "I am really thrilled when I find an academic who can write on matters in his own field. I am generally much more successful with those books than I am dealing with a science journalist, not because the journalist doesn't know, or doesn't write better, but there is a sort of immediacy that you get from the person who has done the research or teaches in that field."

### Challenges

Finding good science writers, especially among working researchers, is indeed one of the problems publishers are

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Stephen Jay Gould



faced with. "Usually, it is not the working scientist who approaches us with proposals; it is the science writer," notes Goldberg.

The strongest constraint on the publishing of science books is still the limited size of the market, as compared to, for example, the fiction market. "From our point of view it is very difficult to sell science books," said Goldberg. "The quantities of books that we import or print are fairly small, 15,000 to 20,000. It is rather difficult to get sales higher than that on most of these books. It is wonderful if you can sell 50,000 copies of a book. Of course, we are not talking of Sagan or Asimov, you understand, where the name sells the book."

The relatively small market imposes limitations on the staff of publishing houses. It is very difficult, for example, to have specialist editors on staff, said Patrick Filley: "First, you can't afford them; second, you can't afford the luxury of just doing science books." Consequently, judging proposals can also offer problems to the publisher. "Everyone tries to measure the veracity of a proposal," comments Filley. "Usually, when we are trying to put something out as 'fact,' we try to have it sponsored by an editor who has unearthed some adequate scientific backing for it."

University presses are in a better position in this regard. Because they have science editors on staff and have contracts with important scientists on their own campuses, they have the opportunity to publish with much more confidence in the validity of their titles. In fact, Cambridge University Press has recently set up a new division for this purpose. "We are reaching the general market," said Paul Wehn, "and we expect that this market will improve for us as we produce more books of this kind."

Most publishers try to keep away from unsound manuscripts. Jake Goldberg sees "the proliferation of the pseudoscientific books, such as Von Daniken or Velikowsky, as a danger. Too many people take these books too seriously because they don't have the scientific background."

"Pseudoscience is the superstition of the scientific age," agrees Scribner, "and I am surprised that so much claptrap in pseudoscientific writing is accepted. You would think that this would fall by the wayside in an age where there is so much scientific understanding, but it doesn't."

Besides unsound manuscripts, there are often just too many books written on the same topic. Certain "fads" that go as fast as they come can cause problems. "There is a glut, for example, in astronomy books right now," says Goldberg. "We have a number of them

**"Science writing is not so brash and full of self-consciousness and untenable claims as it used to be."**

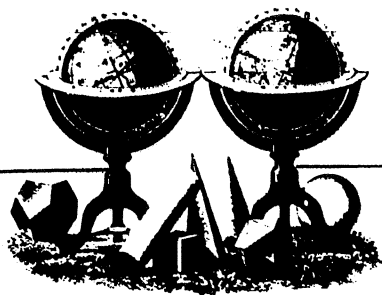
Jacques Barzun



that we are going to publish, but we will be looking very carefully at new proposals."

Unlike scientific and technical books written for professionals, popular science books have the advantage of reaching many more bookstores because they are usually sold as trade books rather than academic titles. But, most importantly, the salespeople can handle them better: "Popular science books are written at the level of the educated layman," says Jack Feyock, manager of bookstores at McGraw-Hill. "Consequently, they are also written on the level of the salespeople."

"The effect of the Walden and Dalton chains is very positive," says Filley. "They give an increasing amount of space to these books, and the buyers in the science area have been pretty good." Most publishers also consider book clubs, particularly the specialist ones, as important outlets. And there is no doubt that some science books now have increasing sales potential. "There have been a couple of books that have hit the bestseller list," says Filley. "With a lot of support—in either rights, television or promotion—I don't think there is any longer a barrier for scientific books." □



# Sci-Tech Books for Fall

## Selected Offerings from Publishers

### Addison-Wesley

**The Addison-Wesley Photo-Atlas of Nursing Procedures** by Pamela L. Swearington (July, \$39.50). An atlas containing over 1500 clinical photographs and the descriptions of more than 300 essential procedures.

**The Helping Group: Therapeutic Principles and Issues** by Martin Lakin (Sept., \$19.95). Covers theory and research as well as practical issues surrounding self-help groups.

### Basic Books

**The New Evolutionary Timetable: Fossils, Genes, and the Origin of Species** by Steven M. Stanley (Sept., paper \$8.95). Shows how new evidence is changing our understanding of evolution.

**The Creation of Matter: The Universe from Beginning to End** by Harald Fritzsch, translated by Jean Steinberg (Oct., \$19.95, illus.). An account of the birth, evolution and probable end of the universe.

**Asimov's New Guide to Science** (rev. ed.) by Isaac Asimov (Nov., \$29.95, illus.). An introduction to several fields of science, including physics, biology, computer science and astronomy.

**Mind, Brain, Body: Toward a Convergence of Psychoanalysis and Neurobiology** by Morton Reiser (Nov., \$19.95). An exploration of the interface among the three realms.

**Individual and Group Therapy: Combining Psychoanalytic Treatments** by Judith Caligor, Nina Fieldsteel and Albert J. Brok (Nov., \$18.95). A comprehensive account of a combined model of psychoanalytically oriented individual and group therapy.

**Psychotherapy in a New Key: A Guide to Time-Limited Dynamic Psychotherapy** by Hans H. Strupp and Jeffrey I. Binder (Nov., \$21.95). Offers an integrated model of therapy and is aimed at the mental health professional.

### Birkhauser Boston

**Imagery in Scientific Thought: Creating 20th-Century Physics** by Arthur I. Miller (Oct., \$30). Explores the historical, philosophical and cognitive psychological aspects of the development of science in the 19th and 20th centuries.

**The Ancient Tradition of Geometric Problems** by Wilbur Knorr (Oct., \$40). A compre-

hensive survey of the ancient Greek geometric tradition.

### Brunner/Mazel

**On Diagnosis: A Systemic Approach** by Michael L. Glenn, M.D. (Aug., \$20). Presents a new way of approaching medical diagnosis.

**The Art of Art Therapy** by Judith A. Rubin (Sept., \$25). A guide for art therapists and other mental health professionals on how to think about art therapy.

### Cambridge University Press

**Our Green and Living World: The Wisdom to Save It** by E. S. Ayensu, V. H. Heywood, G. Lucas, and R. De Filippis (Sept., \$24.95, illus.). An illustrated journey through the deserts, oceans, forests and wetlands of the world.

**Secrets of the Sun** by Ronald Giovanelli (Sept., \$19.95, illus.). Describes for the lay reader and amateur astronomer all the activities which occur on or in the sun.

**Spacelab: Science in Earth Orbit** by David Shapland and Michael Rycroft (Sept., \$19.95, illus.). An account of the development, launch, goals and scientific achievements of Spacelab.

**Colors of the Stars** by David Malin and Paul Murdin (Sept., \$27.50, illus.). An outline of the physical principles at the basis of the colors of stars.

**The Story of the Earth** by Peter Cattermole and Patrick Moore (Sept., \$24.95, illus.). Re-counts the history of our planet from its formation to the emergence of man.

**The Machine at the Bedside: Strategies for Using Technology in Patient Care** edited by S. J. Reiser and M. Anbar (Sept., \$39.50; paper \$14.95). A multidisciplinary approach for practitioners, educators, policy-makers and the public.

### Columbia University Press

**The Voyages of Columbia: The First True Spaceship** by Richard Lewis (Oct., \$24.95, illus.). The whole story of the Space Shuttle program, from its design and planning to the first five operational missions of the spaceship.

**In Praise of Difference: Genetics and Human Affairs** by Albert Jacquard, translated by Margaret M. Moriarty (Oct., \$20, illus.). Discusses genetic diversity and its implications for the human race.

**Archeological Explanation: The Scientific Method in Archeology** by P. J. Watson, S. A. Le Blanc and C. L. Redman (Oct., \$26.50). An account of archeological research design, data recovery and interpretation.

### Doubleday

**Endorphins: New Waves in Brain Chemistry** by Joel Davis (July, \$15.95). An account of medical research with one of the most powerful nonaddictive opiates.

**GAIA: An Atlas of Planet Management** edited by Norman Myers (Nov., \$29.95; paper \$17.95, illus.). An atlas of the earth's resources, its peoples, its global ecology and the environmental crisis it is facing.

**The Science Almanac 1985/1986 Edition** edited by Bryan Bunch (Dec., \$19.95; paper \$12.95). A reference in almanac form featuring the most recent events, discoveries and awards in a wide range of scientific fields.

### Elsevier Science Publishing

**Geology in Engineering** by R. Bowen (July, \$45t). Explains in detail the aspects of geology indispensable to the engineer.

**The Diuretic Manual** edited by J. B. Puschett, M.D. (Aug., \$45t). A physician's source for therapeutic suggestions for various diseases and/or diuretic administration.

**Multiple Perspectives for Decision Making: Bridging the Gap Between Analysis and Action** by Harold A. Linstone (Aug., \$29.50). The how's and why's of decision making based on case studies from government, the military and business.

**Nitrous Oxide** by E. Eger, M.D. (Sept., \$40t). Presents new information about possible toxic effects of these widely used anesthetic.

**Handbook of Systems Analysis: Overview of Uses, Procedures, Applications, and Practice**, edited by Hugh J. Miser and Edward S. Quade (Oct., \$39t). Describes the systems analysis process from initial acknowledgement of a problem to the implementation of findings and the assessment of results.

**Engineering Geology** by Perry Rahn (Nov., \$45t). A comprehensive text taking an environmental approach for students and professionals.

**Handbook of Mathematical Economics, Vol. 3**, edited by Kenneth J. Arrow and Mi-



chael D. Intriligator (Nov., \$50t). Surveys the state of the art of mathematical economics.

#### W. H. Freeman

**Fossils and the Theory of Life** by George Gaylord Simpson (Aug., \$27.95, illus.). A survey of the history of life over three and a half billion years. A Scientific American Book.

**The Science of Musical Sound** by John R. Pierce (Aug., \$27.95, illus.). A discussion of acoustics and computer-generated music for the nonspecialist. A Scientific American Book.

**The Solar System** by Roman Smoluchowski (Aug., \$27.95, illus.). An account of the formation and evolution of the sun and the planetary system. A Scientific American Book.

**From Falling Bodies to Radio Waves: Classical Physicists and Their Discoveries** by Emilio Segré (Aug., \$24.95; paper \$13.95, illus.). An exploration of early physics and physicists.

**A Guided Tour of the Living Cell** by Christian de Duve (Oct., 2 vols., \$55.95t, illus.). An examination of the cell, its organelles and the nucleus. A Scientific American Book.

#### The Free Press (Macmillan)

**Child Sexual Abuse: New Theory and Research** by David Finkelhor (Oct., \$22.50). An overview of the theoretical aspects and research about sexual abuse.

**The Clinical Guide to Child Psychiatry** edited by D. Shaffer, A. Ehrhardt and L. Greenhill (Nov., \$45). A reference for diagnosis and treatment of childhood psychiatric disorders.

**The Population of the United States: Historical Trends and Future Projections** by Donald Bogue (Nov., \$55). Treats the size, growth, age, gender, ethnic and racial composition of the population of the U.S.

#### Greenwood Press

**Understanding the Liver: A History** by Thomas S. Chen and Peter S. Chen (Oct., \$45). An chronologic and thematic exploration of the history of man's thoughts about hepatic structure, function and disorders.

#### The Guilford Press

**Principles and Practice of Stress Management**, edited by Robert L. Woolfolk and Paul M. Lehrer (July, \$35). Offers a wide range of empirically grounded approaches of both Eastern and Western derivation to stress reduction.

**Handbook of Behavioral Medicine** edited by W. Doyle Gentry (Aug., \$40). An interdisciplinary approach to etiology, pathogenesis and treatment of physical illness.

**The Communication of Emotion** by Ross Buck (Aug., \$27.50). A complete survey of nonverbal communication.

#### Gulf Publishing Co.

**Heat Transfer Pocket Handbook: Calculations and Guidelines for Process and Equipment Design** by Nicholas P. Chermisinoff (July, \$24.95, illus.). A reference for process engineers, technicians, students.

**Handbook of Drilling Practices** by Byron S. Davenport (July, \$32.95t, illus.). Covers the entire range of drilling operations.

**Conceptual Cost Estimating** by John S. Page (July, \$49.95). Describes two methods for estimating realistic design and construction costs of chemical, petrochemical plants, refineries and similar industrial facilities.

#### Hippocrene Books

**Flowering Cactus: A Color Guide** by G. Rayzer (Oct., \$12.95). An illustrated guide for 144 species of cacti.

#### Holt, Rinehart and Winston

**Prime Time: Sexual Health for Men over Fifty** by Leslie R. Schover (July, \$15.95, illus.). A guide to the elements of sexual health, including physiological and psychological factors.

**A Young Man's Guide to Sex** by Jay Gale (July, \$14.95, illus.). Includes the coverage of contraception, sexually transmitted diseases, learning and communication.

**Laugh with Health** by Manfred Urs Koch (Aug., paper, \$10.95, illus.). A complete guide to health and diet.

**How to Capitalize on the Video Revolution** by Charlene Canape (Oct., \$16.95). Contains information on how to set up a video business, buy equipment, and market, sell and protect the products.

**The Inner Source: Exploring Hypnosis with Dr. Herbert Spiegel** by Donald S. Connerly (Nov., paper \$7.95). An exploration of the limitless opportunities for healing and personal fulfillment by hypnosis.

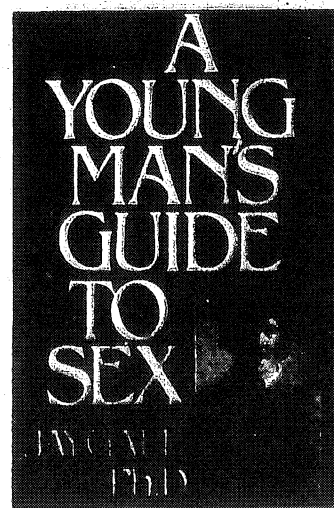
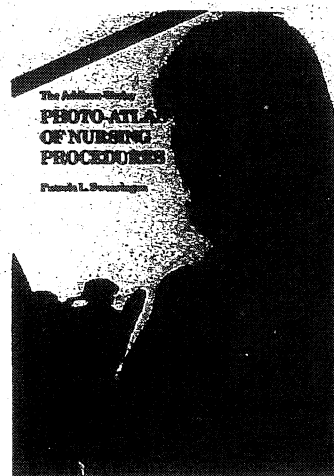
#### Houghton Mifflin

**The Fourth Dimension: Toward a Geometry of Higher Reality** by Rudy Rucker (Sept., \$17.95, illus.). Explores the metaphysical areas of modern physics.

**The Amazing Brain** by Robert Ornstein and Richard F. Thompson (Oct., \$15.95, illus.). A look at the architecture of the brain.

#### Indiana University Press

**The Birds of Indiana** by Russell E. Mumford and Charles E. Keller (Oct., \$49.95, illus.). A



Clockwise from top: Photo-Atlas of Nursing Procedures (Addison-Wesley); A Young Man's Guide to Sex (Holt, Rinehart and Winston); Colours of the Stars (Cambridge U. Press)



detailed survey of birdlife in Indiana, with oil paintings of the 165 species by William Zimmerman.

**Routine Complications: Troubles with Talk Between Doctors and Patients** by Candace West (Nov., \$27.50). A study of constraints on talk between doctors and patients, using conversation analysis.

#### Iowa State University Press

**Diseases of Poultry** (8th ed.) edited by M. S. Hofstad (Sept., \$77.95). Encyclopedic information on poultry diseases.

**Physiology of Crop Plants** by F. P. Gardner, R. B. Pearce and R. L. Mitchell (Sept., \$20). A complete description of growth processes in plants.

**An Introduction to Clinical Laboratory Animal Medicine** by Donald D. Holmes (Oct., paper \$12.95). A practical guide for veterinarians and an introductory text for veterinary students.

#### Keats Publishing

**The Nutrition Desk Reference Manual** by Robert Garrison, Jr. (Dec. \$25). Complete

information on all nutrients, their functions and therapeutic applications.

**1984: The Yearbook of Nutritional Medicine** edited by Jeffrey Bland (Dec., \$39). Experts give their views on progress in nutrition and preventive medicine.

#### Lifetime Learning Publications

**Analysis of Messy Data, Volume 1: Designed Experiments** by George Milliken and Dallas E. Johnson (July, \$45). Presents statistical methods and techniques to effectively analyze nonstandard or messy data sets.

**Project Management for Engineers** by Milton D. Rosenau, Jr. (Aug., \$25, illus.). Includes a discussion of defining, planning, leading, monitoring and completion of projects.

**Industrial Toxicology: Safety and Health Applications in the Workplace** edited by James L. Burson and Phillip L. Williams (Oct., \$41.50, illus.). Stresses toxicological principles as related to the manufacture, storage, use and disposal of industrial materials.

**Digital Transmission Systems** by David R. Smith (Dec., \$44, illus.). A primary text for communication engineers and engineering designers.

#### McGraw-Hill

**McGraw-Hill Dictionary of Engineering** edited by Sybil P. Parker (Sept., \$32.50). A compilation of over 16,000 terms and definitions in all the engineering disciplines.

**McGraw-Hill Dictionary of Chemistry** edited by Sybil P. Parker (Sept., \$32.50). A compilation of 9300 terms and definitions in theoretical and applied chemistry.

#### Macmillan

**Magic Bullets** by Grant Fjermedal (Oct., \$15.95). Describes research in the use of radioactive monoclonal and polyclonal antibodies for the treatment of cancer.

**StarWave: Mind, Consciousness, and Quantum Physics** by Fred Alan Wolf (Nov., \$19.95). Gives an original interpretation of how today's physics can explain the working of the human mind.

#### Methuen

**Mineral Resources** by John A. Wolfe (July, \$31; paper \$16.95). A comprehensive look at the minerals industry and an overview of the histories, occurrences, uses and technical details of the 21 metals and the 18 nonmetals of greatest economic importance. A Chapman & Hall, New York book.

**Geology and the Environment** by D. R. Coates (July, \$35; paper \$16.95). A comprehensive examination of the interrelationships among geology and environmental concerns, including environmental management and law. A Chapman & Hall, New York book.

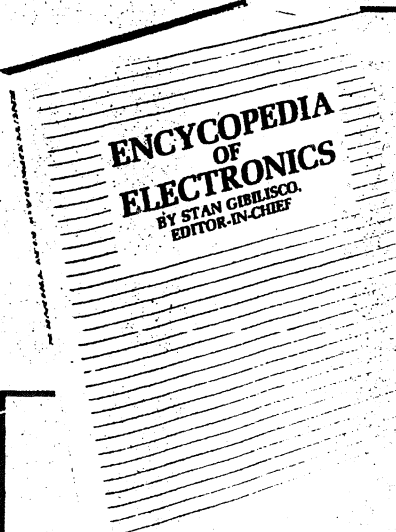
**Field Guide to Soils and the Environment: A Guide for Teaching and Learning About Soil Surveys and Their Applications** by Gerald W. Olson (July, \$33; paper \$18.95). A "hands-on" workbook. A Chapman & Hall, New York book.

**Encyclopedic Dictionary of Industrial Technology: Materials, Processes and Equipment** by David F. Tver and Roger W. Bolz (Aug., \$34.50). A compact reference work covering the entire general manufacturing field. A Chapman & Hall, New York book.

**Gene Cloning: The Mechanics of DNA Manipulation** by David M. Glover (Nov., \$11.95 paper). An overview of genetic engineering research. A Chapman & Hall book.

#### MIT Press

**Beyond Mechanization: Work and Technology in a Post-Industrial Age** by Larry Hirschhorn (Sept., \$17.50). Both a historical and technical perspective on post-industrial technology.



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**The Atom and the Fault: Experts, Earthquakes, and Nuclear Power** by Richard I. Meehan (Oct., \$13.95). Explores the controversy over the earthquake safety of nuclear power plants.

**Genetic Alchemy: The Social History of the Recombinant DNA Controversy** by Sheldon Krimsky (Nov., paper, \$8.95). Summarizes the policy and ethical issues of gene splicing.

**The Physics of the Violin** by Lothar Cremer, translated by John S. Allen (Dec., \$35). Covers the acoustics of stringed instruments.

#### Morrow

**Stephen Hawking's Universe** by John Boslough (July, \$12.95). A popularized introduction to Stephen Hawking's theories on black holes and cosmology.

**Heading Toward Omega: In Search of the Meaning of the Near-Death Experience** by Kenneth Ring (Aug., \$15.95). A study of the near-death experience which focuses on the meaning of it for the survivor and the human evolution.

**Sympathetic Vibrations** by K. C. Cole (Oct., \$15.95). A nontechnical account of how physics pervades our everyday lives.

**The New York Aquarium Guide to Oceanography** edited by Nixon Griffis (Nov., \$17.95, illus.). A collection of articles covering birds, fish, cloud formations and coastal geology, seashells, and estuarine ecology.

#### New American Library

**The Filmmaker's Handbook** by Edward Pincus and Steven Ascher (July, paper, \$12.95, illus.). A comprehensive guide for commercial and independent filmmakers, students and teachers.

**The Blue Planet: A Celebration of the Earth** by Louise B. Young (Sept., paper \$8.95). Explores the latest developments in earth science.

**The Video Moviemaker's Handbook** by Frank Leslie Moore (Nov., paper \$9.95, illus.). A reference and practical how-to manual for the amateur.

#### W. W. Norton

**The Cold and the Dark: The World After Nuclear War** by Carl Sagan and Paul Ehrlich (July, \$12.95). Presents a shocking new picture of the world after nuclear war, based on the research of over 200 scientists.

**How I Photograph Wildlife and Nature** by Leonard Lee Rue III (Oct., \$19.95, illus.). A guide to becoming a wildlife photographer, where to find the wildlife and how to sell the photographs.

**Reed's Nautical Almanac and Coast Pilot: 1985 East Coast Edition** (Oct., \$21.95, illus.). The American edition containing a wealth of navigational material, including visual navigational aids, East Coast tide tables and tidal current charts.

#### Oxford University Press

**Beyond Vision: One Hundred Historic Scientific Photographs** by John Darius (Sept., \$29.95). A compilation of scientific photographs ranging from the first daguerrotypes to digitally encoded photographs.

**Violent Phenomena in the Universe** by Jayant V. Narlikar (Sept., \$9.95, illus.). A description of major discoveries in astronomy during the last two decades.

**Concise Science Dictionary** (Oct., \$19.95). A compilation of 7000 terms in all the fields of science.

**Insects in Camera** by Christopher O'Toole, photographs by Ken Preston-Ma'ham (Oct., \$25). Describes how insects have responded to the "adapt or perish" in evolution.

#### Princeton University Press

**Charles Babbage: Pioneer of the Computer** by Anthony Hyman (Sept., \$27.50; paper

\$9.95). A biography of the British 19th century advocate of the use of science in industry.

**Spatial Orientation: The Spatial Control of Behavior in Animals and Man** by Hermann Schone, translated by Camilla Strausfeld (Oct., \$55; paper \$14.95). A review of research over the past 25 years, including cybernetics.

**The Mechanical Adaptations of Bones** by John Currey (Nov., \$37.50). Relates the mechanical and structural properties of bone in vertebrates and man.

**Medical Thinking: A Historical Preface** by Lester King (Dec., \$27.50; paper \$11.50). Focuses on those aspects of medicine that remain constant through the centuries.

#### Prometheus

**"The Sacred Beetle" and Other Great Essays in Science** edited by Martin Gardner (Sept., \$22.95). A collection of essays ranging from Darwin on evolution to Carl Sagan on the universe.

**Ancient Astronauts, Cosmic Collisions and Other Popular Theories About Man's Past** by William H. Stiebing, Jr. (Sept., \$19.95; paper \$9.95). A critical evaluation of some popular hypotheses about man's past.

**The Gemini Syndrome: A Scientific Evaluation of Astrology** by R. B. Culver and P. A. Ianra (Sept., \$18.95; paper \$11.95). A response by two astronomers to claims by astrologers that their theories are rationally consistent and scientifically based.

#### Scribner's

**Album of Science, Volume 1: Antiquity and the Middle Ages** by John E. Murdoch (Aug., \$50, illus.). A visual record of science through antiquity and the Middle Ages.

**Three Degrees Above Zero: Bell Labs in the Information Age** by Jeremy Bernstein (Sept., \$17.95). An account of research at Bell Labs, including a portrait of its seven Nobel Prize-winning scientists.

**Inscrutable Earth: Explorations into the Science of Earth** by Ronald B. Parker (Oct., \$14.95). An exploration of how geology tackles fundamental questions as old as the earth.

**A Scientist at the Seashore** by James Trefil (Nov., \$16.95, illus.). Illuminates the forces governing life on earth via explanations of waves, tides and other seaside phenomena.

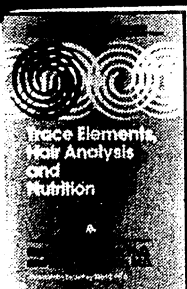
**A Passion to Know: 20 Profiles in Science** edited by Allen Hammond (Nov., \$15.95, illus.). Portrays some of the most colorful and creative scientific thinkers.

#### Shoe String Press

**Victorian Science and Religion: A Bibliography with Emphasis on Evolution, Be-**

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**Idea, and Unbelief, Comprised of Works Published from ca. 1900 to 1975** by Sydney Elsen and Bernard Lightman (Sept., \$42.50). An annotated bibliography of secondary works dealing with both ideas and institutions.

### Springer

**Mathematics for Econometrics** by P. J. Dhrymes (2nd. ed., July, paper \$19.80). Contains all the mathematics needed for the accompanying text, "Introductory Econometrics."

**Concepts in Viral Pathogenesis** edited by Abner L. Notkins and Michael B. A. Oldstone (July, \$29.80). A series of articles on the mechanisms by which viruses cause diseases.

**Why Math?** edited by R. D. Driver (Aug., \$24). A text designed for the development of mathematical literacy of students pursuing a liberal arts degree. Undergraduate Texts in Math.

**Compatible and Incompatible Relationships**, edited by William Ickes (Sept., \$42.50). Documents the interpersonal processes by which relationships begin, intensify, deteriorate and finally dissolve. Springer Series in Social Psychology.

**The Geology of the Atlantic Ocean** by K. O. Emery and Elazer Uchupi (Dec., \$98; map set \$45). A comprehensive treatment of the ocean floor and adjacent continents, including geological history, plate movements and potential economic value of resources.

### Stackpole Books

**The New Race for Space: The U.S. and Russia Leap to the Challenge for Unlimited Rewards** by James Oberg (Sept., paper \$14.95 illus.). Compares the accomplishments and goals of the U.S. and Soviet space programs.

### Unipub

**Genetics: New Frontiers** (Nov., 4 vols, \$185). Details of the latest worldwide advances and research in genetics, from the International Congress of Genetics at New Delhi, December 1983.

### University of California Press

**A Functional Biology of Free-Living Protozoa** by Johanna Laybourn Parry (Sept., \$24.50). Discusses the physiology, ecology and evolutionary biology of the protozoa in nature.

**The Foundations of Psychoanalysis: A Philosophical Critique** by Adolf Grünbaum (Oct., \$16.95). A comprehensive philosophical examination of Freud's theories.

**Science and Values: The Aims of Science and Their Role in Scientific Debate** by Larry Laudan (Nov., \$14.95). Discusses

some basic agreements and disagreements in science.

**The Limits of Science** by Nicholas Resher (Dec., \$28.50). Considers the existence of limitations on scientific inquiry that could in principle preclude the full realization of the aims of science.

### University of Massachusetts Press

**Curious Naturalists** by Niko Tinbergen (Nov., paper \$9.95). Descriptions of the author's encounters with bees and bee hunters, birds and insects in a wide variety of locations.

### University Press of New England

**Sustaining Tomorrow: A Strategy for World Conservation and Development**, edited by Francis R. Thibodeau and Hermann H. Field (Nov., \$22.50; paper \$12.50). An up-to-date sourcebook on the rapidly evolving international environmental situation.

### University of Texas Press

**Peppers: The Domesticated Capsicums** by Jean Andrews (Nov., \$35, illus.). A description of the growth, botany and natural history of the capsicum.

### Van Nostrand Reinhold

**Colon Cancer Genetics** by Patrick M. Lynch and Henry T. Lynch (Aug., \$44, illus.). An orientation course for physicians, pathologists, geneticists and preventive medicine specialists.

**The Encyclopedia of Physics** (3rd ed.) edited by Robert M. Besancon (Aug., \$119.95). A single-volume encyclopedia containing 354 articles.

**Handbook of Printed Circuit Manufacturing** by Raymond H. Clark (Sept., \$49.50, illus.). A reference source for anyone designing, manufacturing or selling printed circuits.

**A Practical Guide to Writing and Publishing Professional Books: Business, Technical, Scientific, Scholarly** by Daniel N. Fishel (Oct., \$22.95). A guide aimed at professionals.

**Introduction to Fuzzy Arithmetic** by Arnold Kaufmann and Madan Gupta (Oct., \$57.50). An introduction to an arithmetical system for the handling of imprecise, vague, ill-defined and doubtful information.

### John Wiley

**Drug Consultant 1984-1985: A Current Guide to Clinical Drug Treatments and Their Usefulness** edited by Rhoda M. Michaelis and G. R. Brown (July, \$18.95, paper). Answers questions on drug treatments for each organ.

**Occupational Biomechanics** by Don Chaffin and Gunnar B. J. Andersson (Aug., \$29.50, illus.). Covers biomechanical princi-

ples for evaluating and designing the work environment.

**Reference Manual for Telecommunication Engineering** by Robert L. Freeman (Aug., \$75). Contains graphs, tables and figures that communications engineers need for daily reference.

**Behavioral Health: A Handbook of Health Enhancement and Disease Prevention** edited by J. D. Matarazzo, N. E. Miller, S. M. Weiss, A. J. A. Hord and Sharlene M. Weiss (Aug., \$55). A guide for physicians and mental health professionals for the application of behavioral and biomedical science techniques to the maintenance of health.

**The Psychologist as Expert Witness** by Theodore H. Blau (Sept., \$35). Covers what the psychologist should know before being called as an expert witness in court proceedings.

**Handbook of Counseling Psychology** edited by Steven D. Brown and Robert W. Lent (Sept., \$58). Covers vocational and career counseling, personal counseling, emotional problems and other topics of interest to mental health practitioners.

**Knowing and Making Wine** by Emile Peynaud (Oct., \$34.95). A survey of wine-making techniques and wine appreciation for professional wine-makers and amateur wine enthusiasts.

**A Guide to Nuclear Power Technology: A Resource for Decisionmakers** by Frank J. Rahn and Robert A. Meyers (Nov., \$65). A complete survey of nuclear power technology including nuclear physics, risk assessment, and a discussion of the Three Mile Island accident.

**Kirk-Othmer Concise Encyclopedia of Chemical Technology** edited by Martin Grayson (Dec., \$99.95). A 1.8 million-word abridgment of the 26-volume third edition of the *Kirk-Othmer Encyclopedia of Chemical Technology*.

### Yale University Press

**Discovers of the Lost World: An Account of Some Who Brought Back to Life South American Mammals Long Buried in the Abyss of Time** by George Gaylord Simpson (Sept., \$25, illus.). The story of the scientists who discovered the "lost world" of extinct species in South America.

**T. H. Huxley's Place in Natural Science** by Mario A. di Gregorio (Oct., \$25). An outline of Huxley's major contributions to science.

**To Do No Harm: DES and the Dilemmas of Modern Medicine** by Roberta J. Apfel, M.D. and Susan M. Fisher, M.D. (Nov., \$15.95). The story of the disaster of DES, including a discussion of the medical and psychological effects of DES. □

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# Publishers Weekly

The Journal of the Book Industry

SCI-TECH BOOKS: THE ACQUISITION PROCESS

NEW SCI-TECH BOOKS

1984 BOOK OUTPUT & PRICES: FINAL FIGURES

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by JEAN M. AUDEL

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# Bringing in the Books

## Acquisition in Sci-Tech Publishing Is a Venturesome Affair

by Alexander Hellemans



Photographs © Alexander Hellemans

Klaus Peters, president, Birkhäuser Boston

We commonly picture an acquisitions editor as someone sitting at a desk snowed under by mounds of manuscripts, a large part of his job consisting of separating the wheat from the chaff. If this image is a fair depiction of the editor of fiction at a commercial house, or even the scholarly nonfiction editor in the humanities, it definitely does not correspond to the role of the acquisitions editor in the field of technical and scientific books.

"One thing an acquisitions editor in the scientific and technical field cannot do is sit back and wait for manuscripts to come in," says Harold Crawford, editor-in-chief for technical books at McGraw-Hill. Donald Degenhardt, editor for physics at Oxford University Press, agrees: "The publishing of a book for an academic in the humanities is an important career step, maybe a step on the road to tenure, and my colleagues in the humanities get a large number of manuscripts from aspiring professors. There is quite a large effort devoted just to sifting the literally dozens of manuscripts that arrive every week. But the publishing of books, whether monographs or textbooks, is not really seen as an important success indicator in a scientist's career."

The editors *PW* talked to generally agreed that scientists, doctors and engineers form the group that is the most difficult to convince to write a book. "Writing books is not their business,"

says Alan Liss, president of Alan R. Liss Inc. "It is secondary, a sideline, a nuisance, an interference with what they are trying to do. You have to have a good project to intrigue somebody."

It is a fact that writing research papers contributes much more to the advancement of the scientist's career than writing books. Ironically, "We are competing with the system of 'publish or perish,'" says Yale Altman, senior editor at Elsevier Science Publishing. "They have to publish research, which of course brings in grants. Their whole livelihood and future depend on what they bring in on scientific grants."

And the progress of science itself makes it more difficult for researchers to accept book assignments. Klaus Peters, president of Birkhäuser Boston, explains that 50 years ago the situation was quite different: "For example, if there was a certain speciality in mathematics, it was clear that two or three people were experts in that subject, and for them it was an honor to present their point of view. So you could convince one of these three to write a book. Now the subject has split up in so many sub-specialities that if somebody wants to write a book that also touches upon the research of other people, he has to make a large effort to assimilate the other people's work."

Even the economic crush of recent years has made itself felt in the offices of technical publishers. "There is greater pressure on people in industry to create increased efficiency in their own jobs and to devote more of their time to turning industry around, so that there is a greater reluctance to get

themselves involved with books as well," says Crawford.

Fortunately, a large number of scientists are authoring books, although their number does not increase at the rate of growth of science in general. "Many of the people who are determined to write a book have a certain goal," says Altman. "The motivation usually isn't money. It is the feeling of creating a field, or having students use their book, or developing courses of which not many exist." Many write textbooks and, according to Altman, "the incentive is the prestige of having an outstanding book used by a large number of students."

"The financial rewards are also, in the case of textbooks, not to be taken lightly," continues Altman. "In some cases they can be incredibly high." By and large, however, the financial aspect of a book plays only a minor role. "I never knew anybody who actually wrote a medical book for money," says Lewis Reines, president of Lippincott.

Degenhardt also agrees that "for a lot of people, writing a book is still a personal satisfaction and achievement, the satisfaction of spreading their ideas to a wider audience in a more accessible and more permanent form than journal articles."

A number of scientists reflect their sometimes several decades of research in a book: "Chandrasekhars's book, *The Mathematical Theory of Black Holes*, is a prime example where a single author has developed a very theoretical field himself, has published papers, and then has set a period of time to finish a monograph on that area."

*Hellemans works at the American Institute of Physics and is also a freelance writer.*





Left: Yale Altman, senior editor, Elsevier Science Publishers



Donald Degenhardt, editor for physics, Oxford University Press



Harold Crawford, editor-in-chief, technical books, McGraw-Hill

continues Degenhardt. Unfortunately this happens too rarely, he adds. "There are a lot of subjects at the moment where the subject is ripe and the definitive book is waiting to be written. Yet one cannot convince any of the top people in the field to set aside the time to write the book. They are too busy advancing the field."

Certain groups of scientists do, however, see a book as a means of furthering their career. Carol Beasley, publisher of engineering, computer science and mathematics at Wiley, finds this to be the case for her authors: "It is true that for most of the professionals we deal with, they have an awful lot of opportunities to make money if they get professional recognition. And publishing is one among many competing opportunities." Crawford takes this idea even one step further: "We often have an author who is affiliated with a particular company. This company is quite delighted to have its famous person represented in the field. The affiliation it-

self is tremendous publicity, and often the company will be very cooperative in the use of its facilities for the development of books."

Some scientists, especially those writing for a general audience, write to further science itself. "In a time when the funding of science is not particularly strong, those scientists believe it is important for the public to understand what science is and what it contributes to the culture," says Linda Chaput, president of W. H. Freeman.

#### The Acquisition Process

Because science has grown to such proportions, even the acquisitions editor with a substantial research background has to rely on advisors from the scientific or technical community. Peters, who himself is a mathematician and chose a career in publishing after a six-month sabbatical from his university, considers advisors as the *sine qua non* for the acquisition of high-quality books: "There are maybe 30 to 50 people all over the world on whom I rely very heavily for reviewing books, getting advice, finding out about new trends in their field and for the finding of the right authors."

The university presses are of course in the most favorable position in regard to advisors; many of them can look for advisors to faculty members on their own campuses. But advisors from other universities can play an influential role. "For our Oxford Series in Physics, in the 1930s when it started, we managed to get the top people in the Cavendish Laboratory in Cambridge to be the series editors," says Degen-

hardt. "The result of that was that most of the important physics that was done in Cambridge was published in Oxford. This was a 'scoop' of the time, and one that has benefited us ever since."

Although journals compete with publishers for the authors' time, they are viewed as beneficial: "Since at Elsevier we have so many journals, we are dealing with people at the forefront of many fields," says Altman. "We can develop books around certain journals because we reach such a captive audience. It is easier to cluster books and journals, and we get ideas from various people for books." Carol Beasley finds this synergism also useful: "There have been a number of instances where someone who contributed to a journal of ours turns into a book author, or a book author turns into a journal editor."

Of course, potential authors themselves are the best sources for new book ideas. However, their suggestions by themselves are usually not sufficient to start up a project. "The best launch is by some happy accident where the publisher and the author have the idea virtually simultaneously," says Degenhardt, "but this is rare. . . ."

Often the idea originates with the editors themselves. "It is nice when you can suggest an idea to an author and have the idea taken up. I think those books are often satisfactory—from the publisher's point of view, obviously," says Degenhardt. Altman agrees: "In fact, many of the better science books in the last five or 10 years came about because the publisher approached a particular individual and asked that person to write that book," says Altman. "These people are not just going to sit around and write an outline and four chapters and submit it to you. The idea has to come from you, and once it comes from you, it makes it a lot easier for them. And if you make that situation attractive in terms of editorial help and financial rewards and so on, they will consider it."

Not all editors agree with this completely: "We don't find that we propose books," says Myer Kutz, executive publisher of scientific and technical books at Wiley. "What you do is that you probably find somebody who has gotten somewhat of a start on a book. Because of time pressure and the amount of money you can earn as an author by writing a book, it is hard to find somebody to start from scratch to fill a need. From an economic viewpoint it doesn't make sense to authors—except in some cases such as computer science or electrical engineering."

Often a course taught at a university is the starting point for a book. Altman cites as an example E. R. Kandel and J. H. Schwartz's *Principles of Neural Science*: "Kandel had a syllabus for

four or five years and he was anxious to see this put in a book form and to reshape the curriculum and teaching of neural science. Fortunately we acquired the book and exactly what was expected happened: it has become the leading book in the field."

#### Incentives for the Author

Important in convincing an author to sign up a book is what the publisher can offer him. "In my view, the incentives are distribution and the speed of publication," says Peters. "Reputation of the programs in which the book is published is very important too. Less important, with some exceptions, is the financial aspect."

Linda Chaput believes that it is easier for her editors to sign up scientists, such as Emilio Segrè or Steven Weinberg, writing for a general audience, because of "our commitment to present science in a way that is coherent and does not trivialize it. Many of them dread doing books that are commercially successful, but not substantial."

Much less understood by authors, but crucial for the successful completion of a project, is the support a publisher can give during writing. "Many of the people we approach are rather startled by the idea of being asked to do a book," says Crawford. "They don't consider themselves necessarily the best writer. And it is here where acquisition editors have to give encouragement, to indicate to them that they will be given all the help that is necessary to produce the manuscript." Especially when scientists set out to write a book for a general public, "they invariably discover that it is much more work than they ever had expected," says Linda Chaput. "They are gratified to know that an editor is reading, is understanding or not understanding, what they are trying to say, and that gives them the courage to continue writing."

#### The Editor's Background

Although they all work in the field of science and technology, acquisitions editors usually have a much wider variety of backgrounds than their authors. Opinions vary widely on how important is a training in science or technology. "There are two schools of thought on that," says Degenhardt. "My own training is in physics, and I like to think I can use that, and I like to feel I can perhaps establish a rapport with the scientists at a slightly more professional level, but there are very successful scientific editors who are trained in the humanities. Both schools can exist in the same publishing house. I know a large commercial publishing house in which the physics editor is a humanist and the chemistry editor is a chemist." Crawford agrees: "I have seen extraordinarily successful acquisitions editors,

**"There are a lot of subjects [for which] the definitive book is waiting to be written. Yet one cannot convince any of the top people in the field to set aside the time to write the book"**

both in McGraw-Hill and in other publishing houses, who are not schooled in engineering or the sciences at all." And he continues: "One of the arguments I have believed in over the years is that if an acquisitions editor has a background that is in a particular field, that can—but not necessarily so—make that person a little bit too biased. They might ride their hobbyhorses." "For our editors it is almost detrimental to know too much about a field," says Chaput, "because of our fiat that the most important part of their job is to act as an advocate for our readers."

Of course, a background in the field you are working in should not actually disqualify you in your work. "It is very useful to have a solid training in one science, having done research yourself," says Peters. "You then have a totally different attitude towards problems. The next thing is that you have to forget this training totally: you cannot go to an author and discuss your own interests. You have to be able to suppress that and be a good listener."

The growth in science is such that even an acquisitions editor with a solid background in science soon finds himself slipping back into the position of an editor virtually without scientific training. "After two years of being an editor, you don't really have the knowledge and the strength anymore to go into a scientific discussion," finds Peters. Kutz sees the proliferation of fields as an important problem: "The scientific disciplines are broken down into a great many small areas. Within chemistry you have dozens and dozens of different areas, and there is no chemist who knows them all. We have three PhD chemists who work as editors, and they cannot know in depth all the areas we publish in; they can know only one or two."

Most editors agree that a scientific or technical background is useful in this profession, but it definitely doesn't suffice to make you a successful editor. "I think it is important to have a wide range of contacts in the different fields you are active in," says Altman. "Also the willingness to go out, visit and talk

to a wide variety of people. I don't think there is any substitute for just knocking on doors and finding out what is happening. You cannot just sit in the office and rely on a few advisors; you sort of lose touch."

The capability of projecting into the next three to five years is important. "The talents we look for include a sense of strategic planning," says Kutz. "We want the editors to take a long-range view of the subject areas they are responsible for, and to be able to plan, because there is competition for resources, and we want to be able to put our resources in the most productive place." And Beasley adds: "They must be able to understand from a very few clues where their discipline is moving. Out at the forefront you get a lot of mixed signals about which research directions are going to be significant, what the field is going to look like."

A fourth necessity is an increased awareness of the market. According to Kutz, "There is a fundamental change beginning to take place throughout professional and reference publishing. Editors will be more responsible for how well their books do than in the past. It used to be that the focus was entirely on signing contracts, getting the manuscripts successfully into production, and then going on to more contracts and more manuscripts. Now, in addition to planning, in addition to keeping up with the marketplace, we also want editors to focus on how well their books are selling, and to keep consulting with the marketing people to see what ideas might help in the marketing process." Crawford finds this to be true at McGraw-Hill: "Our editors have to be totally involved and highly responsible for the financial aspects of their projects."

Not only contact with the marketing people is helpful, but also contact with the future readers of the books: "We publish in fairly small quantities, so we want to know what, for example, polymer chemists are interested in over the next three to five years," says Kutz. "We have fairly large travel budgets for our editors. They go out actively talking to people, getting, as we put it, 'close to the marketplace.'"

"In the textbook field, editors certainly need to know the market," says Howard Aksent, publisher at Harper & Row. "They need a familiarity with what is going on in the college marketplace for scientific textbooks. They need to understand the curriculum, and how it works."

Editors and publishers play a substantial role in originating and creating books in science and technology. But the author remains primary. "You can bring in editors and assistant editors and all sorts of internal help, but there is no substitute for that author to do the work," says Altman. □

## Evolution of Matter and Energy

Springer-Verlag



Editor: Alexander Hellemans

# Sci-Tech Books for Fall

## A Selective Listing of Highlights

### ACADEMIC PRESS

**The Effects of Noise on Man** (2nd ed.) by Karl D. Kryter (July, \$34.50). A reference source of up-to-date research knowledge concerning effects of noise on people; reports and analyzes major procedures used in regulation and control of noise.

**Iron Fortification of Foods** edited by Fergus M. Clydesdale and Kathryn L. Wiemer (July, \$36.50). Analyzes the problems encountered in treating anemia through iron fortification of staple foods and beverages.

**Methods for the Oxidation of Organic Compounds: Alkanes, Alkenes, Alkynes, and Arenes** by Alan H. Haines (Aug. \$83). Effective oxidative techniques for the synthetic chemist, including practical hints, detailed examples and full references to the original literature.

**Animal Cell Biotechnology, Volumes 1 and 2** edited by R. E. Spier and J. B. Griffiths (Sept., \$47 and \$59 respectively). A practical introduction to and an in-depth survey of a new and largely uncharted facet of biotechnology.

**Molecular Cytology, Volume 1: The Cell Cycle; Volume 2: Cell Interactions** by Jean Brachet (Dec., price not set). Reviews state-of-the-art knowledge of the morphology and biochemistry of cells, from cytoplasmic organelles to differentiated and malignant cells.

### ADDISON-WESLEY

**Computational Physics** by Steven E. Koonin (Sept., \$31.95). Explains the modeling of physical processes on a computer by using numerical techniques.

**Introduction to Robotics: Mechanics and Control** by John J. Craig (Sept., \$35.95). An advanced text that covers the mechanics,

control and programming of robots and mechanical manipulators.

**Genetics and Molecular Biology** by Robert Schleif (Oct., \$35.95). A unified, advanced treatment of the fundamental material of molecular biology.

**Manual of Nursing Therapeutics** by Pamela L. Swearingen (Nov., spiral-bound, \$17.95). A manual on the planning of effective nursing care.

### ARTECH HOUSE

**Microwave Integrated Circuits** (2nd ed.) edited by J. Frey and K. Bhasin (Aug., paper \$45). A collection of 53 articles on computer-aided design of microwave integrated circuits.

**Microwaves Made Simple: Principles and Applications** by W. Stephen Cheung and Frederic H. Levien (Oct., \$50). An introduction for microwave technicians, technical managers and electronics students.

**Principles of Secure Communication Systems** by Don J. Torrieri (Sept., \$61). A source on protecting modern communication systems.

### ATHENEUM

**On the Frontiers of Science** by G. Harry Stine (Aug., \$8.95). A how-to manual for building machines that should not work according to current principles.

### BASIC BOOKS

**The Interpersonal World of the Infant: A View from Psychoanalysis and Developmental Psychology** by Daniel N. Stern (Aug., \$22.95). Discusses a theory, based on psychoanalysis, of how human beings create a sense of themselves and their relation to others.

**The Theory and Practice of Group Psychotherapy** (3rd ed.) by Irvin D. Yalom (Sept., \$22.95). A standard text which combines the author's clinical experience with the results of the latest research.

**Theaters of the Mind: Illusion and Truth on the Psychoanalytic Stage** by Joyce McDougall (Nov., \$24.95). Hypotheses, interpretation and insights from the practice of psychoanalysis.

### BIRKHAUSER BOSTON

**Quest for the Killers** by June Goodfield (Sept., \$24.95, illus.). The companion volume to the PBS series on scientists' and doctors' battle against disease.

**Science, Computers, and People: From the Tree of Mathematics**, Stanislaw Ulam edited by Gian-Carlo Rota and Mark Reynolds (Sept., \$14.95, illus.). A collection of essays focusing on philosophical, historical and scientific topics related to Ulam's work.

**Diamond Dealers and Feather Merchants: Tales from the Sciences** by Irving M. Klotz (Oct., \$14.95, illus.). A tour of scientific battles between the guardians of the status quo and proponents of radical, untested ideas.

**The Tender Ship: Governmental Direction of Technology** by Arthur M. Squires (Nov., \$16.95, illus.). Discusses cooperation—or the lack thereof—between government and private industry in technological management.

**Halley's Comet: Encounter 1986** by G. A. Tammann and Philippe Veron (Nov., \$14.95, illus.). A presentation of the science and myths created in the wake of Halley's Comet.

**The Verification Challenge: Problems and Promise of Strategic Nuclear Arms Control Verification** by Richard A. Scribner, William Metz and Theodore Ralston (Nov., pa-



# The Culture of Technology

Arnold Pacey



From "The Culture of Technology" (MIT Press)

paper \$15, illus.). Discusses the nature of verification problems and the degrees of confidence and uncertainty of available verification methods.

R.R. BOWKER

**Scientific & Technical Books & Serials In Print, 1986** edited by Andrew Grabis (Dec., \$149.95t). Includes more than 115,000 book entries and 18,000 serial entries.

BRUNNER/MAZEL

**The Real Self: A Developmental, Self, and Object Relations Approach** by James F. Masterson (Oct., \$25t). Discusses a concept of the real self and its disorders.

**A DSM III Casebook of Differential Therapeutics: A Clinical Guide to Treatment Selection** by Samuel Perry, Allen Frances and John Clarkin (Oct., \$37.50). Over 50 case examples illustrating the field of treatment selection.

**Ericksonian Monographs No. 1: Elements and Dimensions of an Ericksonian Approach** edited by Stephen R. Lankton (Oct., \$22.50). The inaugural issue of a series of monographs on Ericksonian hypnosis and family therapy.

**Comprehensive Family Therapy: An Integration of Systemic and Psychodynamic Treatment Models** by Diana Adile Kirschner and Sam Kirschner (Dec., \$30t). A synergistic approach to psychotherapy that integrates systemic and psychodynamic treatment models.

CAMBRIDGE UNIVERSITY PRESS

**The Cambridge Atlas of Astronomy** edited by Jean Audouze and Guy Israel (July, \$75, illus.). A one-volume reference on astronomy containing 1100 photographs and illustrations.

**The Mechanical Universe: Introduction to Mechanics and Heat** by Richard Olenick, Tom M. Apostol and David L. Goodstein (Aug., \$32.50t, illus.). The book that accompanies the PBS television course entitled *The Mechanical Universe*.

**Seven Clues to the Origin of Life: A Scientific Detective Story** by A. G. Cairns-Smith (Aug., \$17.95t). The search for the solution to the mystery of the origin of life, using the methods of Sherlock Holmes.

**From Quark to Quasar** by Peter H. Cado-

gan (Oct., \$19.95t, illus.). A journey from the small world of elementary particles to the entire universe through 26 steps in increasing order of magnitude.

**Basic Astrophotography** by Michael Covington (Oct., \$24.95t, illus.). A guide for amateur astronomers and photographers.

**The Cambridge Astronomy Guide: An Introduction to Practical Astronomy** by William Liller and Ben Mayer (Nov., \$24.95t, illus.). A guide for the amateur wishing to contribute to astronomy.

**Supernovae** by Paul Murdin and Lesley Murdin (Nov., \$19.95t, illus.). A discussion of supernovae, pulsars and nucleosynthesis for the lay reader.

CROWN

**Einstein In America** by Jamie Sayen (July, \$17.95, illus.). An account of Einstein's years in Princeton.

**The Skywatcher's Handbook** by Colin Ronan (July, \$13.95, illus.). A complete astronomical guide to the stars and heavenly bodies.

**The Columbia College of Physicians and Surgeons Complete Home Medical Guide** edited by Genell J. Subak-Sharpe (Nov., \$39.95, illus.). A comprehensive medical guide with contributions by 58 physicians.

DELL

**The Women's Drugstore** by Harold Silverman (Sept., \$9.95 paper). A comprehensive

reference on the entire spectrum of prescription and non-prescription drugs for women's health problems.

DOVER

**Frontiers of Modern Physics: New Perspectives on Cosmology, Relativity, Black Holes and Extraterrestrial Intelligence** by Tony Rothman and others (Oct., paper, \$7.95t). A collection of seven articles accessible to the lay reader.

ELSEVIER SCIENCE PUBLISHING

**Paul Ehrenfest, Volume 1: The Making of a Theoretical Physicist** by M. J. Klein (July, paper \$22.50). Covers the life and work up to 1920 of a physicist who played a unique role in the development of physics early in this century.

**Principles of Neural Science** (2nd ed.) edited by Eric R. Kandel and James H. Schwartz (July, \$47.50). An introduction to the study of the brain, its structure, function and development, and the control of behavior.

**Petroleum Effect in the Arctic Environment** edited by F. R. Engelhardt (July, \$63). Discusses the physical and ecological effects of petroleum in the Arctic environment, a potential source for petroleum.

**Abbreviations Dictionary: Augmented International Seventh Edition** by Ralph DeSola (Sept., \$45). A standard reference.

**Digital Filters: Theory and Applications** by Nirmal Bose (Oct., \$44.95). A treatment that includes filtering over a finite field, 2-D filter theory and linear shift-variant filters.

W. H. FREEMAN

**Constructing the Universe** by David Layzer (Aug., \$27.95, illus.). Explores Newton's and Einstein's theories of space, time and gravity. A Scientific American Book.

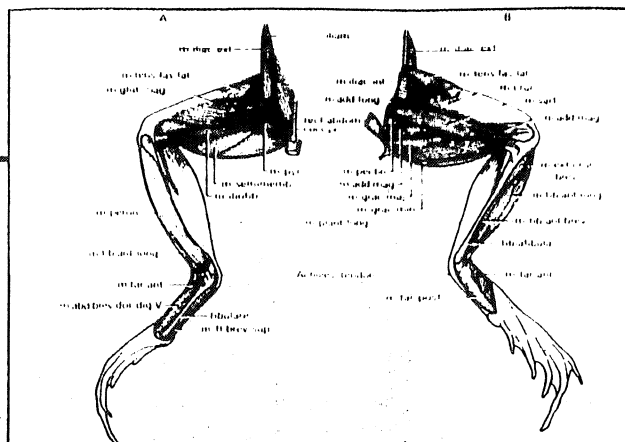
**Language, Script, and the Computer** edited by William S-Y. Wang (Aug., paper \$12.95t). Thirteen articles ranging from the advent of speech to artificial intelligence. Scientific American Reader.

**Human Genetics: An Introduction to the Principles of Heredity** (2nd ed.) by Sam Singer (Oct., paper \$13.95t, illus.). Treats the fundamentals of human genetics in a historical approach.

**The Messengers of Life** by Lawrence Crapo (Oct., \$21.95t; paper \$11.95t). Explains the nature, function and production of hormones.

**The Mind's Eye** edited by Jeremy M. Wolfe (Oct., paper \$12.95t). A collection of articles about vision, illusions, imagery and the workings of the mind.

**An Introduction to Cancer Biology** edited by Errol Friedberg (Oct., paper \$12.95t). A collection of articles on major types of can-



Cover (right) and illustrations by Linda Trueb from "Biology of Amphibians" (McGraw-Hill)

cer, carcinogens and the function of DNA, and malignant transformation.

#### HARMONY BOOKS

**Advanced Technology Warfare** by Richard S. Frieman and others (Nov., \$22.95; paper \$12.95). A look at the multi-billion-dollar high-technology war industry.

#### HARPER & ROW

**The Enigmas of Chance: An Autobiography** by Marc Kac (Sept., \$16.95). A brilliant mathematician offers a rare look at the inside world of mathematics and physics.

**The High Cost of High Tech: The Dark Side of the Chip** by Len Siegel and John Markoff (Nov., \$16.50). A discussion of how the chip is affecting our future.

**On Becoming a Biologist** by John Janovy Jr. (Nov., \$13.95). A noted naturalist discusses biology as a career.

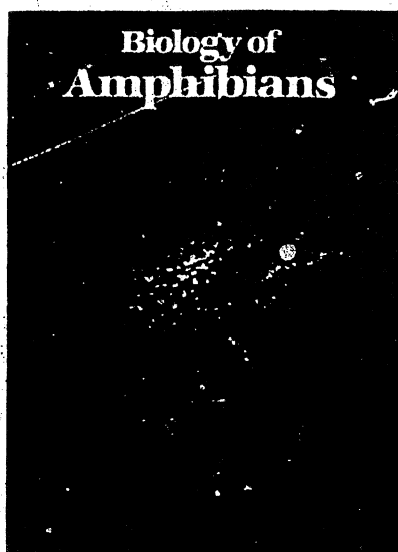
#### HARVARD UNIVERSITY PRESS

**Sexual Selection in Animal Genitalia** by William C. Eberhard (Nov., \$25, illus.). Presents a new theory that explains male genital evolution as a result of sexual selection.

**Chemotherapy in Psychiatry: Principles and Practice** (Revised and enlarged edition) by Ross J. Baldessarini (Nov., \$25, illus.). Provides rational and scientific underpinnings for the treatment of patients.

**The Human Skeleton** by Pat Shipman, Alan Walker and David Bichell (Dec., \$27.50, illus.). A comprehensive study of the human skeleton, including functional and dynamic aspects.

**Niels Bohr: A Centenary Volume** edited by A. P. French and P. J. Kennedy (Dec., \$27.50, illus.). Combines assessments by nearly 30 eminent scientists with some of Bohr's most insightful writings.



#### HOLT, RINEHART AND WINSTON

**Licence to Rape: Sexual Abuse of Wives** by David Finkelhor and Kersti Yllo (July, \$16.95). An examination of the psychological and social implications of sexual abuse within marriages.

**Imaging Saturn** by Henry S. F. Cooper Jr. (Nov., paper \$8.95, illus.). A moment-by-moment account of the Voyager I and Voyager II missions which provided the first close-up pictures of Saturn.

#### THE JOHNS HOPKINS UNIVERSITY PRESS

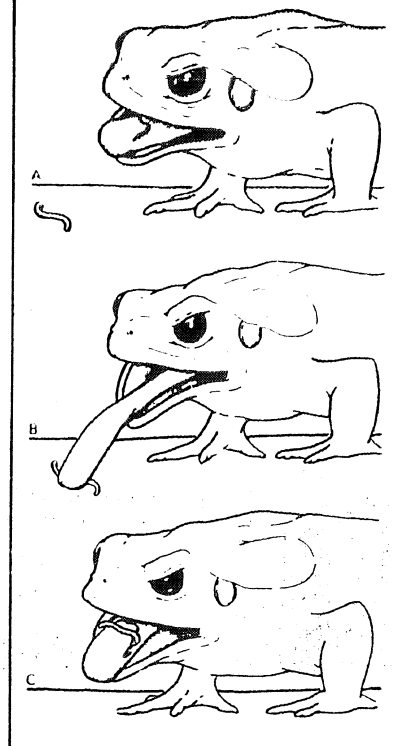
**Agricultural Change and Rural Poverty** edited by John Mellor and Gunvant Desai (Oct., \$24.95). An assessment of the interrelationships among poverty, food prices and the growth performance of agriculture.

#### KEATS PUBLISHING

**The Nutrition Desk Reference** by Robert H. Garrison Jr. and Elizabeth Somer (July, \$29.95). A basic resource including overviews of essential nutrients, the role of diet in health, and drug-nutrient interaction.

**1984-85 Yearbook of Nutritional Medicine** edited by Jeffrey Bland (July, \$39.95). Twelve nutrition specialists present new findings in nutritional research.

**Dr. Abram Hoffer's Guide to the Identification and Treatment of Schizophrenia** by



**Abram Hoffer** (Nov., \$14.95; paper \$9.95). Explains schizophrenia and related mental illnesses and describes the role of nutrition in their treatment.

**Nutrition for the General Practitioner** by Abram Hoffer (Dec., \$16.95). A basic resource for the GP on the role of preventive health care and the orthomolecular approach to traditional medicine.

**Nutrition in Nursing** by Betty Kamen and Lynn Fraley (Dec., \$14.95). A basic resource for nursing professionals.

#### McGRAW-HILL

**Biology of Amphibians** by William E. Duellman and Linda Trueb (Sept., \$40, illus.). A reference summarizing the functional and evolutionary biology of amphibians.

**McGraw-Hill Dictionary of Biology** edited by Sybil P. Parker (Sept., paper \$15.95). A compilation of over 15,000 terms and definitions in all the biological sciences.

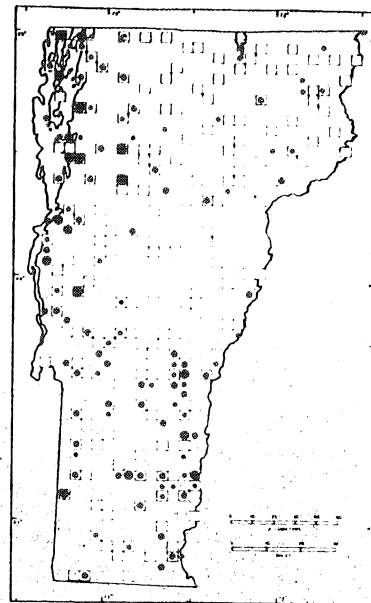
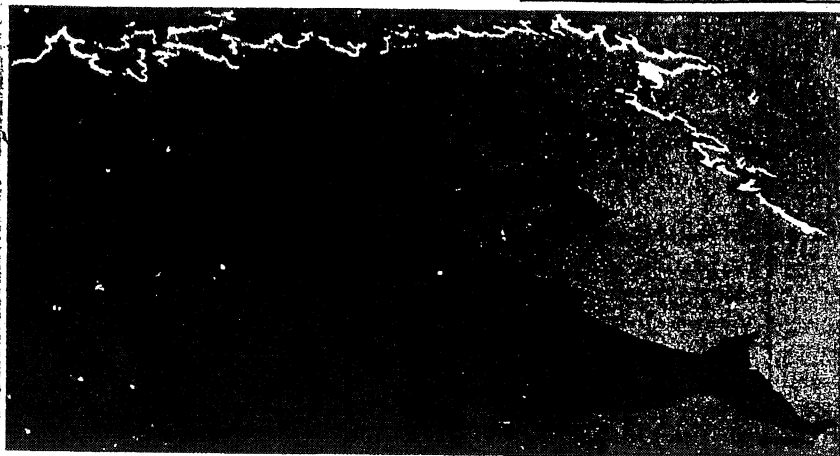
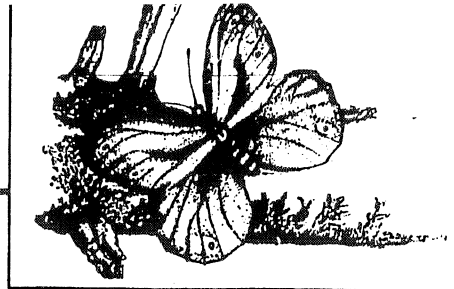
**McGraw-Hill Dictionary of Chemical Terms** edited by Sybil P. Parker (Sept., paper \$15.95). A compilation of more than 11,300 terms and definitions in all the fields of chemistry.

**McGraw-Hill Dictionary of Physics** edited by Sybil P. Parker (Sept., paper \$15.95). A compilation of over 11,400 terms and definitions in all areas of physics.

**Electronics Applications Sourcebook, 1986 Edition** edited by Harry L. Helms (Oct., two vols., \$250). A compilation of application notes providing essential data and guidelines for engineers and technical professionals.

**Design of Earthquake-Resistant Buildings** by Minoru Wakabayashi (Oct., \$44.50). Presents the results of the cooperation between Japan and the U.S. on research involving earthquakes and building design.

Below: from "Wings in the Sea: The Humpback Whale" (University Press of New England)



Top left: from "Bogs of the Northeast," "Atlas of Breeding Birds of Vermont" (University Press of New England)

**Materials Handbook** (12th ed.) by George S. Brady and Henry R. Clauser (Nov., \$49.50). Contains information on some 13,000 materials and substances.

**Standard Handbook of Professional Consulting Engineering Practice** by Tyler G. Hicks and Jerome F. Mueller (Nov., \$39.95). A guide to techniques for starting, staffing, expanding and prospering in a consulting engineering business.

#### MACMILLAN

**Introduction to Bryology** by Wilfred B. Schofield (Aug., \$45, illus.). An introduction to the structure, evolution and interrelationships of mosses, liverworts and hornworts.

**Dictionary of Robotics** by Harry Waldman (Aug., \$34.95, illus.). A compilation of 2000 terms and definitions in robotics and related fields.

**Astrophotography: A Step by Step Approach** by Robert T. Little (Sept., \$19.95, illus.). A guide for the beginning astrophotographer.

**Masks of the Universe** by Edward R. Harrison (Oct., \$18.95, illus.). A discussion of the conception of the universe, ranging from the earliest visions to modern cosmology.

#### METHUEN

**Walking Machines: An Introduction to Legged Robots** by D. J. Todd (July, \$39.50). Discusses the history and recent developments in legged machines.

**Handbook of High Speed Machining Technology** by Robert I. King (July, \$44.50). A reference on recent research and production development in high-rate metal removal.

**Amino Acids and Peptides** by J. S. Davies (Oct., paper, \$69.95). A desk-top reference with over 1000 entries on 5000 compounds.

**Handling and Management of Hazardous**

**Wastes** by T. H. Allegri Sr. (Oct., \$45). Describes the manner in which hazardous materials must be dealt with, including legal and ethical aspects.

**Handbook of Engineering Geomorphology** edited by P. G. Fookes and P. R. Vaughan (Nov., \$66). A practical, field-oriented book for designer and contractor.

#### MIT PRESS

**The Natural History of Primates** by J. R. Napier and P. H. Napier (Sept., \$19.95, illus.). An introduction to the order of primates, including evolutionary aspects and anatomy.

**Military Enterprise and Technological Change: Perspectives on the American Experience** edited by Meritt Roe Smith (Sept., \$30, illus.). A study of the influence of the military on technological development in the U.S.

**Vaulting Ambition: Sociobiology and the Quest for Human Nature** by Philip Kitcher (Oct., \$25). A critical evaluation of the claims made by sociobiologists about human nature.

#### NEW AMERICAN LIBRARY

**The Mosby Medical Encyclopedia** (Nov. \$10.95). A reference work on current medical issues, including information on prescription drugs.

**The Nova National Science Test** by Ted Bogosian and WGBH Boston (Oct., \$6.95). The educational companion volume to the special quiz features shown on Nova.

#### NORTON

**Psychotherapeutic Change: An Alternative Approach to Meaning and Measurement** by Alvin R. Mahrer (Sept., \$22.95). Introduces an approach based on in-therapy change paradigm using illustrations from psychotherapeutic sessions.

**Genograms in Family Assessment** by Monica McGoldrick and Randy Gerson (Oct., paper, \$9.95). Explains a graphic way of organizing the mass of information gathered during a family assessment.

**Working with Families of the Mentally Ill** by Kayla Bernheim and Anthony Lehman (Dec., \$18.95). Presents a practical, psycho-educational approach.

#### PANTHEON

**Space, Time, Infinity: The Smithsonian Views the Universe** by James S. Trefil (Sept., \$29.95, illus.). An encompassing view of the universe from theories of its origin to the theories of the "new physicists."

#### PHALAROPE BOOKS

**Insect Life: A Field Entomology Manual for the Amateur Naturalist** by Ross H. Arnett and Richard L. Jacques (Aug., paper \$14.95). Teaches how to identify, collect, preserve and raise insects and discusses aspects of insect life.

**Pond and Brook: A Guide to Nature Study in Freshwater Environments** by Michael J. Caduto (Nov., paper, \$12.95, illus.). An examination of all types of life forms found in ponds, lakes, streams, rivers and wetlands.

#### PLENUM

**The Great American Biotic Interchange** edited by Francis G. Stehli and S. David Webb (Oct., \$75). A number of contributions on inter-American biotic interchange as well as the plate tectonics of the Caribbean.

**Fiber Optics: Technology and Applications** by Steward D. Personick (Oct., \$45). A discussion of fiber optical technology, especially in regard to applications in information technology and sensing systems.

**Health Psychology: A Psychobiological Perspective** by Michael Feuerstein, Elise E. Labbe and Andrzej R. Kuczmierczyk (Dec.,

# CHEMICAL TERMS

# THE HIGH COST OF HIGH TECH

\$21.50). A presentation of the theoretical, empirical and clinical aspects of the field of health psychology.

## PRENTICE-HALL

**Teaching Children about Science: Ideas and Activities Every Teacher and Parent Can Use** by Elaine Levenson (Sept., paper \$14.95). A guide especially intended for teachers without scientific training.

**The Earth and How It Works: Projects, Ideas, and Activities in Environmental Science** by Philip R. Holzinger (Oct., paper \$10.95). A lab manual and workbook.

**Teaching the Fun of Physics: 101 Activities to Make Science Education Easy and Enjoyable** by Janice Pratt Van Cleave (Oct., paper \$9.95). An "idea catalogue" of classroom experiments for elementary schools and science fairs.

**Toward a New Brain: Evolution and the Human Mind** by Stuart Litvak and A. Wayne Senzee (Nov., paper \$8.95). A comprehensive critique of Darwinism based on the study of the genesis and nature of the brain.

## PRINCETON UNIVERSITY PRESS

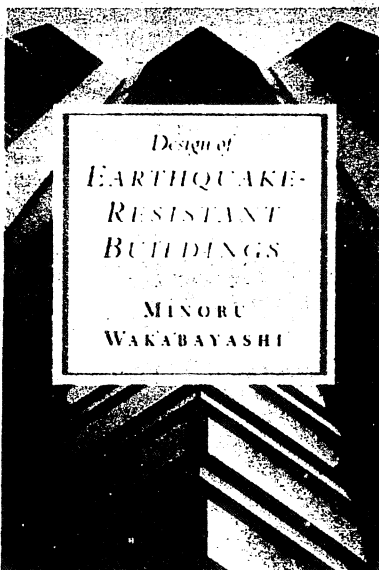
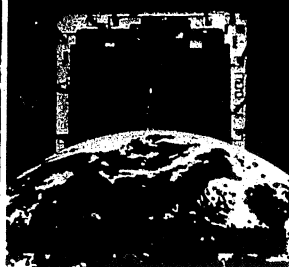
**A Guide to the Birds of Colombia** by Steven L. Hilly and William L. Brown (July, \$95; paper \$42.50t, illus.). A description of nearly 1700 species of South American birds.

**Honeybee Ecology: A Study of Adaptation in Social Life** by Thomas D. Seeley (Oct., \$39.50; paper \$14.50, illus.). Studies the diversity of traits of honeybees from a natural selection perspective.

**QED: The Strange Theory of Light and Matter** by Richard P. Feynman (Nov., \$18.50t, illus.). A treatment of quantum electrodynamics for the lay reader.

**Birds of New Guinea** by Bruce M. Beehler, Thane K. Pratt and Dale A. Zimmerman (Nov., \$65; paper \$37.50t, illus.). A field guide to more than 700 species of birds.

**Bird of Passage: Recollections of a Physicist** by Rudolph Peirls (Nov., \$29.50t, illus.). Memoirs by one of the initiators of atomic-bomb research during World War II.



Clockwise from left: from "Design of Earthquake-Resistant Buildings" (McGraw-Hill), "McGraw-Hill Dictionary of Chemical Terms," "The High Cost of High Tech" (Harper & Row)

## SCRIBNERS

**The Universe Next Door: A Complete Guide to Exploring the Skies and Understanding What You See** by Terry Holt (Oct., \$24.95, illus.). A handbook for the amateur.

**The Audubon Society Guide to Attracting Birds** by Stephen W. Kress (Oct., \$24.95). A compact encyclopedia of bird habitats, behavior and lore.

**Build Your Own Telescope** by Richard Berry (Oct., \$24.95). Contains the complete plans for five high-quality telescopes.

**Mayonnalse and the Origin of Life** by Harold J. Morowitz (Nov., \$15.95). A collection of 50 essays interweaving biology, the physical sciences and personal experience.

## SHERIDAN HOUSE

**Fly and Survive: Safety in General Aviation** edited by Ronald and Leslie Hurst (July, \$26.50, illus.). An international group of experts covers the important aspects of aviation safety.

**Aviation in Crop Protection, Pollution and Insect Control** by H. R. Quantick (July, \$45, illus.). A guide for using helicopters or airplanes in the aerial application of solids and liquids.

**Introduction to Internal Combustion Engines** by Richard Stone (Aug., \$55; paper \$24.50, illus.). A first text for students.

**Aviation Fuels Technology** by Eric Goodger and Ray Vere (Oct., \$65, illus.). Contains information on aviation fuels, fuel specifications, engine types, fuel substitutes and prospects.

## SPRINGER PUBLISHING

**Overcoming Resistance: Helping Difficult Clients with Rational-Emotive Therapy** by Albert Ellis (July, \$21). A comprehensive discussion of resistance to therapy and techniques to overcome this resistance.

**Productive Aging** by Robert N. Butler and Herbert P. Gleason (Aug., \$25.95). Considers productivity and the positive contributions of older people.

**The Male Batterer: A Treatment Approach** by Daniel Sonkin and others (Aug., \$24.95). Describes a treatment for males who use physical, sexual and psychological violence in their personal relationships.

**Widow-to-Widow** by Phyllis Silverman (Dec., \$19.95). Discusses current research on bereavement and the psychology and problems of widows.

**Family Therapy for Suicidal People** by Joseph Richman (Dec., \$27.95). An aid for professional practitioners drawing on both family systems and psychodynamic approaches.

## SPRINGER-VERLAG

**The Beauty of Doing Mathematics** by Serge Lang (Aug., \$19.80). Three dialogues between Serge Lang and a general audience on the true nature of mathematics.

**Evolution of Matter and Energy** by M. Taube (Aug., \$24). A unified description of nature from the elementary particles to the universe as a whole.

**Variable Stars** by Gerold Richter and Wolfgang Wenzel (Sept., \$43). An up-to-date survey for the astronomer, but also an introduction for the well-prepared amateur.

**Fundamentals of Neurophysiology** (3rd ed.) by Robert Schmidt (Oct., paper \$19.95). An introduction to neurophysiology and brain research.

**Magical World of Minerals** by Olaf Medenbach (Oct., \$44, illus.). An introduction to the world of minerals, with 125 full-color photographs.

## TAB BOOKS

**Basic Electronic Test Procedures** (2nd ed.) by Irving M. Gottlieb (Aug., \$23.95; paper \$16.45). A step-by-step guide for electronic tests and measurements.

**Cellular Telephones: A Layman's Guide** by Stuart Crump Jr. (Aug., \$15.95, paper

\$9.65). A guide for the prospective buyer of a car telephone.

**Troubleshooting and Repairing Satellite TV Systems** by Richard Maddox (Sept., \$22.95; paper \$14.95). A complete reference with schemas of satellite TV receivers.

**The Complete Handbook of Magnetic Recording** (3rd ed.) by Finn Jorgensen (Sept., \$25). Includes audio, video and digital recording and computer applications.

**Basic Electronics Theory with Experiments and Projects** (2nd ed.) by Delton T. Horn (Dec., \$29.95; paper \$16.45). Includes information on many new electronic technologies, such as satellite, cable and pay TV and video recorders.

#### TEXAS A & M UNIVERSITY PRESS

**Mathematical Foundations of Population Dynamics** by Guy L. Curry and Richard M. Feldman (Dec., \$42.50, illus.). A comprehensive synthesis of mathematical procedures for the modeling of population dynamics.

#### UNIVERSE

**Universe Guide to Stars and Planets** by Ian Ridpath (July, \$19.95; paper \$10.95, illus.). A guide for identifying constellations, stars and planets using only an ordinary pair of binoculars.

#### UNIVERSITY PRESS OF NEW ENGLAND

**The Atlas of Breeding Birds of Vermont** edited by Sarah B. Laughlin and Douglas P. Kibbe (July, \$45, illus.). Defines the distribution of the 179 species nesting in Vermont.

**Wings in the Sea: The Humpback Whale** by Lois King Winn and Howard E. Winn (July, \$25; paper \$15.95, illus.). A scientific account of the humpback whale for the lay reader.

**Bogs of the Northeast** by Charles W. Johnson (Aug., \$25; paper \$11.95, illus.). A presentation of bogs in New England, New York, New Jersey and Pennsylvania.

**Wildlands and Woodlots: The Story of New England's Forests** by Lloyd C. Irland (Sept., paper \$9.95). A nontechnical discussion of issues related to forests, such as

Diane Lynch-Fraser

## GETTING READY TO READ:

## NOVA NATIONAL SCIENCE TEST

Clockwise from left: "Nova National Science Test" and "Getting Ready to Read" (both NAL), "What Went Wrong?" (Gulf Publishing)

(Sept., \$49.50). Discusses magnetic phenomena from Ampere's Law to electromagnetic field theory.

**Injection Molding Handbook** by Dominick V. Rosato and Donald V. Rosato (Oct., \$86.50). Covers all aspects of the technique, including computer-aided design and mold design.

#### JOHN WILEY

**Biology of the Reptilia. Volume 14: Development A** edited by Carl Gans (July, \$79.95). A comprehensive discussion of the developmental biology

of reptiles, including embryology, anatomy, physiology and neurology.

**Patty's Industrial Hygiene and Toxicology** (2nd. ed.) edited by Lewis and Lester Cralley; Volume 3a: *The Work Environment* (Aug., \$95); Volume 3b: *Biological Responses* (Aug., \$90). Part of the classic reference for the occupational health field.

**Bailey's Industrial Oil and Fat Products, Volume 3** edited by Thomas H. Applewhite (Sept., \$55). Contains information on fractionation, winterization, margarine shortenings, specialty fats, deodorization and other areas.

**Buildings Systems Integration Handbook** edited by Richard D. Rush (Oct., \$89.95). A reference with contributions from over 100 building and design experts.

**Resolving Marital Conflicts** by H. S. Streen (Oct., \$28.95). A guide for therapists and counselors.

**Paradoxical Strategies in Psychotherapy** by M. Seltzer (Nov., \$27.95). Outlines new psychotherapeutic tactics for the mental health professional.

#### YALE UNIVERSITY PRESS

**Geological Factors and the Evolution of Plants** edited by Bruce Tiffney (Oct., \$23.50, illus.). A collection of essays on the interaction of organism and environment as viewed on the paleontological time scale.

**The Burgess Shale** by H. B. Whittington (Oct., \$23.50, illus.). The first comprehensive study of a formation in southwest Canada that is one of the richest fossil records from the Cambrian era.

**How to Write a Scientific Paper** by Michael J. Katz (Dec., \$18; paper \$5.95). Takes the reader through every step of the writing process, using a published paper as a guide.

## What Went Wrong?

Case Histories of Process Plant Disasters

Trevor A. Kletz

products, policies, ownership and future needs.

**Prevention in Health Psychology** edited by James C. Rosen and Laura J. Solomon (Oct., \$35; paper \$22.50). Twenty-six psychology and physical health experts discuss preventive health care.

#### VAN NOSTRAND REINHOLD

**Planetary Ecology** edited by Douglas E. Caldwell, Corale L. Brierley and James A. Brierley (July, \$57.50). An interdisciplinary approach with contributions from 106 scientists.

**Handbook of Magnetic Phenomena for Electronic Engineers** by Harry Burke

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BILLED TO AIP, 24 OCT. 94, WITH  
ABOUT 1½" OF MATERIAL (ALL THE  
ARTICLES).

**Greystone**  
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**Work phone: 301-209-3051**

October 22, 1994

Ms. Dorothy Dugandzic  
Journal Production Editor  
Ablex Publishing Corporation  
355 Chestnut Street  
Norwood, NJ 07648

Dear Ms. Dugandzic

I am returning the proofs you sent with some comments pencilled in the margins. I think this work looks very good in print. I am grateful to the *Creativity Research Journal* for finding it a home. Here are some thoughts:

1. I didn't find a list of participants, with their affiliations. I thought this would be very useful, both as a guide to the reader and as an explanation for some references in the text to people, such as Sir James Black, whose work is not included. I am sure Marc Runco and Bill O'Reilly have this list.

2. The treatment of book titles is inconsistent. Perhaps there is a convention in the journal that could be applied, or one could be decided, such as single quotes with initial caps then lower case. Periodicals of course are italicized and titles of articles could take double quotes. Probably a complete check of reference handling should be made. But do we want to use double quotes for all article titles in the lists of references? I think so.

3. The italicizing of conversation has introduced one or two problems. I felt that converting former italics to roman did not work in several cases and I have changed it. Some authors may object. I think it is o.k. for a periodical to be roman in an italic conversation.

4. I have not kept a copy of my current edits. If there is a question, please feel free to fax me the page with a question.

5. Where the KEKEDA program is introduced, all caps have been used. Later, on page 356, 358 and 360, it is referred to as Kekada. I prefer the latter.

7. Some things should be checked globally. Judgment is mixed between English (judgement) and American usage. In the U.S., analog is preferred to analogue.

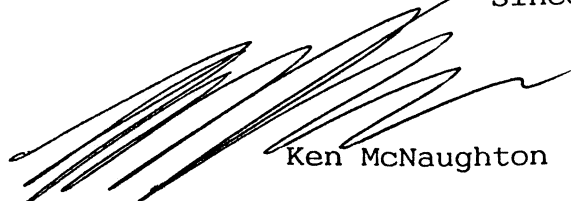
8. Some text looks cramped. Are different justification methods used through the text?

9. For footnotes, I prefer flush left throughout.

10. There is at least one reference "in press" (p. 402). This should be checked with authors to see if it has now been published (global check?).

Thank you for this opportunity to check the proofs. If you have any questions, please let me know.

Sincerely

A handwritten signature in black ink, consisting of several overlapping, stylized loops and strokes, positioned above the printed name.

Ken McNaughton (Mr.)



# CREATIVITY RESEARCH JOURNAL

Volume 7, Numbers 3 & 4, 1994

SPECIAL ISSUE: CREATIVITY AND DISCOVERY IN BIOMEDICAL SCIENCES

GUEST EDITOR: KEN McNAUGHTON

SPONSOR: ROYAL SOCIETY OF MEDICINE, LONDON

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and Jonathan R. Cole



SECRET  
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HAS AN UNLIFT

DUPLICATE

FILE

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## Creativity and Discovery:

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### An Introduction to the Special Issue

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William G. O'Reilly and Frederic L. Holmes

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The collective success of science is grounded in the capacities of many individual scientists to do original, innovative work. Productivity is not enough. The progressive character and the discipline of science, and its ability to advance, relies upon the creative qualities of the thinking and experimental endeavors of those who populate its investigative frontiers. Nonetheless, the nature of creativity remains as elusive in science as it does in other domains of human activity.

Scientific creativity has become the subject of investigation in fields as diverse as sociology, philosophy of science, history of science, and cognitive science. It has become a matter of practical concern for the managers of academic departments, research divisions of vast pharmaceutical corporations, and many other enterprises where scientists work. Those who guide such enterprises, if they are to be successful, must be concerned with recognizing scientists who show creative promise and with maintaining an environment within which creative talents will be encouraged and nurtured. Consequently, a better understanding of the characteristics and sources of scientific creativity is of considerable practical as well as intellectual interest.

The purpose of the meeting reported in

the present issue of *CRJ* was to bring together scientists whose careers exemplified high levels of originality, discovery, and creative activity with scholars who had contributed significantly to the study of the creative process. The conference organizers hoped that purposeful discussion between scientists, reflecting from their experiences, and scholars, bringing analytical methods to bear on examination of personal experiences, would stimulate lively exchanges and insights that would not have been anticipated beforehand.

The meeting extended over two full days. In the interests of promoting discussion, each of the scientists had been asked to present an informal, anecdotal story in the form of a memorandum, the essential ingredient of which was to be an episode that they considered to be of special relevance to them in their career or representative of their method of scientific enquiry. These accounts became the subject of discussion for each morning session.

Those invited because of their work in studying creativity were asked to prepare an original paper, bearing on an essential question relevant to the nature of scientific re-

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Correspondence and requests for reprints should be sent to William O'Reilly, The Royal Society of Medicine Foundation, 150 East 58th Street, New York, NY 10155-0002.

FORM NLRB-4762  
(1-83)UNITED STATES OF AMERICA  
NATIONAL LABOR RELATIONS BOARD

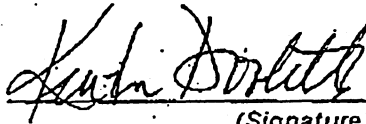
## NOTICE OF APPEAL

To: Mr. Mark L. Sussman  
Jackson, Lewis, Schnitzler & Krupman  
1000 Woodbury Road, Suite 402  
Woodbury, NY 11197

Date: March 16, 2001

Please be advised that an appeal is being taken to the General Counsel of the National Labor Relations Board from the action of the Regional Director in refusing to issue a complaint on the charge in Case Name(s) American Institute of Physics

Case No. 5-CA-29366 (If more than one case number, include all case numbers in which appeal is taken.)



(Signature)

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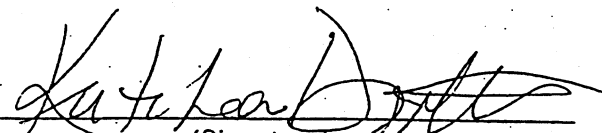
NOTICE OF APPEAL

To: General Counsel  
National Labor Relations Board  
Office of Appeals, Room 8820  
Franklin Court Building  
1099 14th Street, NW  
Washington, DC 20570

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(Signature)